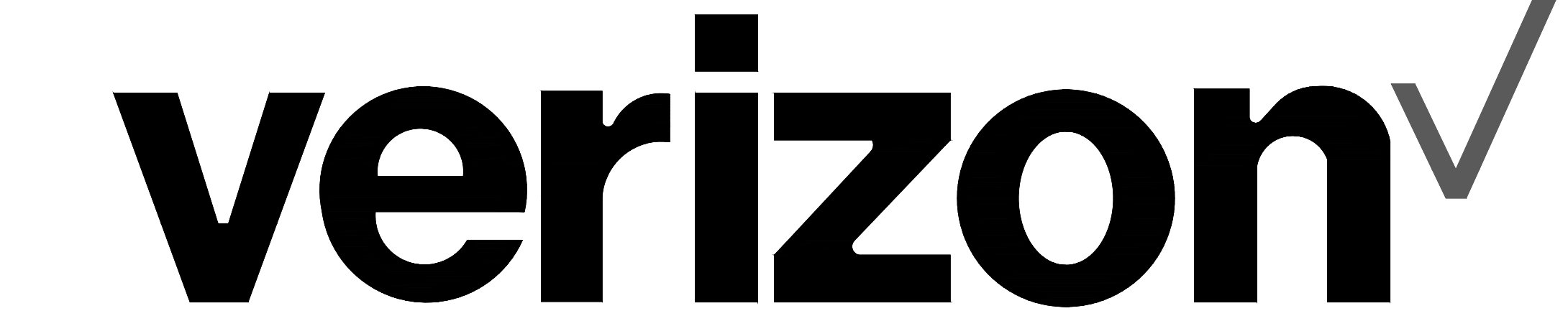
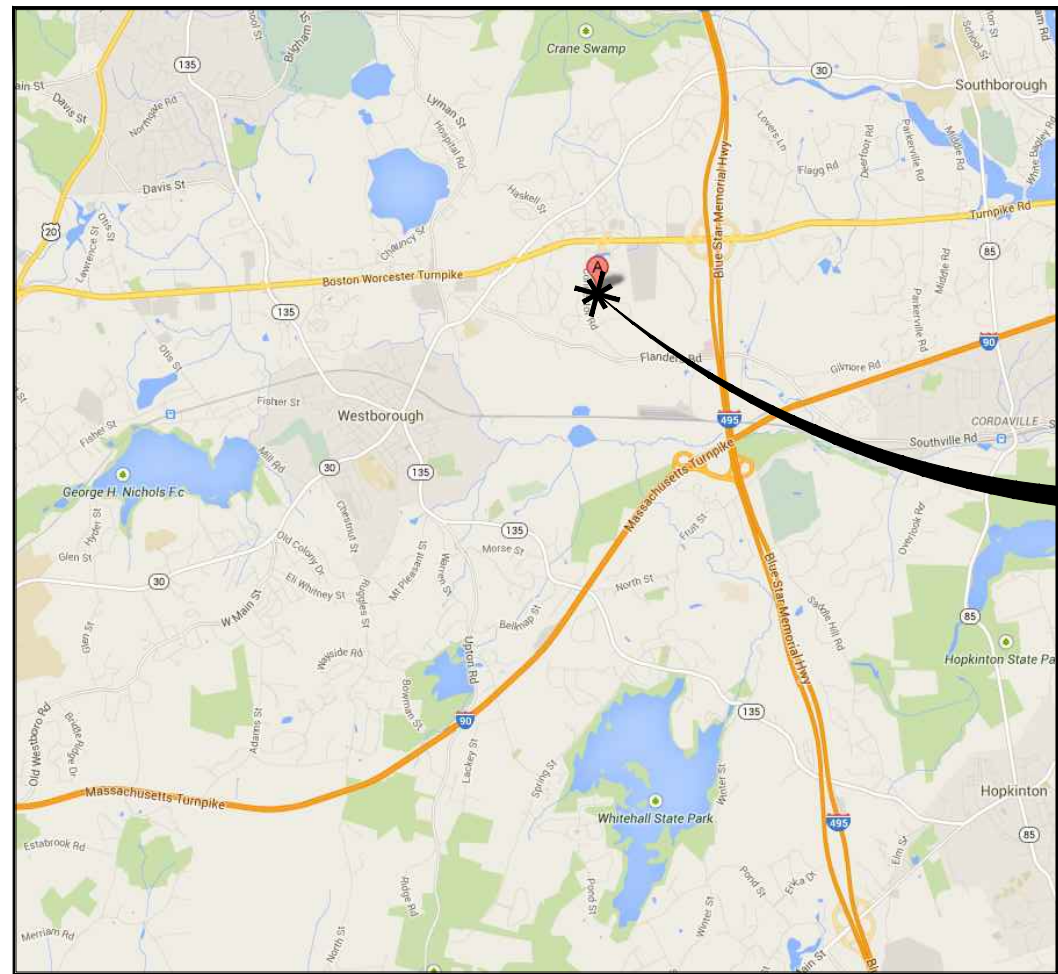


VICINITY MAP (NTS)



WESTBOROUGH MEC PHASE 2

PROCORE PROJECT No: 13758-20-01
400 FRIBERG PARKWAY, WESTBOROUGH, MA 01581
ISSUED FOR BUILDING PERMIT
MAY 29, 2020



LOCATION MAP (NTS)

PLANNING AND BUILDING DEPARTMENT
TOWN OF WESTBOROUGH
45 WEST MAIN STREET
WESTBOROUGH, MA 01581
PHONE: (508) 366-3015
CONTACT: FRED LONARDO

ARCHITECTURAL FIRM
MORRISON HERSHFIELD CORP.
1455 LINCOLN PARKWAY, SUITE 500
ATLANTA, GA 30346
PHONE (404) 291-7013
FAX (770) 379-8501
PROJECT MANAGER: KATHERINE McGAH, AIA

ELECTRICAL ENGINEERING FIRM
MORRISON HERSHFIELD CORP.
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LEAD: BABLU KAZI, PE

FIRE PROTECTION DESIGNER
MORRISON HERSHFIELD CORP.
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MECHANICAL ENGINEERING FIRM
MORRISON HERSHFIELD CORP.
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NSTD169 COMMISSIONING
TPI
302 NEW MILL LANE
EXTON, PA 19341
PHONE: (610) 524-7260
CONTACT: JEFF CANTOR

VERIZON ENGINEERING DIRECTOR
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581
PHONE: (508) 330-3302
CONTACT: RICHARD ENRIGHT

OWNERS CONSTRUCTION MANAGER
VERIZON WIRELESS
118 FLANDERS ROAD
WESTBOROUGH, MA 01581
PHONE: (617) 312-4991
CONTACT: JOHN SOPER

VZW NETWORK COMPLIANCE
VERIZON WIRELESS
132 CREEK CIRCLE
E. SYRACUSE, NY 13057
PHONE: (315) 877-6153
CONTACT: PHIL DUCHENE

PROPERTY OWNER
CELCO PARTNERSHIP
D/B/A BELL ATLANTIC MOBILE
BEDMINSTER, NJ 07921

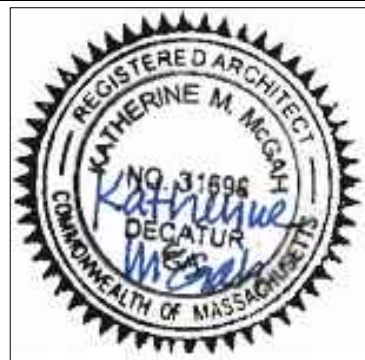
VZW NETWORK COMPLIANCE
VERIZON WIRELESS
180 WASHINGTON VALLEY ROAD
BEDMINSTER, NJ 07921
PHONE: (908) 477-1474
CONTACT: NICK SAPIA

VZW AREA POWER AND GROUNDING ENGINEER
VERIZON WIRELESS
24242 NORTHWESTERN HWY
SOUTHFIELD, MI 48075
PHONE: (248) 392-0915
CONTACT: PETE SANDAS

VZW NETWORK COMPLIANCE
VERIZON WIRELESS
180 WASHINGTON VALLEY ROAD
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PHONE: (908) 306-7581
CONTACT: MIKE TRZASKA

VZW NETWORK COMPLIANCE
VERIZON WIRELESS
10300 OLD ALABAMA RD CONNECTOR
ALPHARETTA, GA 30022
PHONE: (678) 277-3523
CONTACT: JIM FEENEY

DRAWING NUMBER	DRAWING NAME	RELEASE						DRAWING NUMBER	DRAWING NAME	RELEASE						DRAWING NUMBER	DRAWING NAME	RELEASE						
		EOS 03.06.20	BIDS & CONST. 03.27.20	BULLETIN No. 1 04.16.20	REISSUE FOR CONSTRUCT 04.16.20	ISSUED FOR PERMIT 05.29.20				EOS 03.06.20	BIDS & CONST. 03.27.20	BULLETIN No. 1 04.16.20	REISSUE FOR CONSTRUCT 04.16.20	ISSUED FOR PERMIT 05.29.20				EOS 03.06.20	BIDS & CONST. 03.27.20	BULLETIN No. 1 04.16.20	REISSUE FOR CONSTRUCT 04.16.20	ISSUED FOR PERMIT 05.29.20		
GENERAL								BAS/MECHANICAL								ELECTRICAL								
TS001	COVER SHEET	X	X		X	X		BA001	Building Automation General Notes & Legend	X	X		X	X		E001	ELECTRICAL GENERAL NOTES , ABBREVIATIONS AND LEGEND	X	X		X	X		
G001	GENERAL NOTES	X	X		X	X		BA110	Building Automation-Overall Floor Plan	X	X		X	X		E110	OVERALL FLOOR PLAN	X	X		X	X		
G002	GENERAL CONSTRUCTION NOTES	X	X		X	X		BA111	Building Automation-Enlarged Floor Plan	X	X		X	X		E111	POWER FLOOR PLAN	X	X	X	X	X		
G010	VZW STANDARDS REQUIREMENTS	X	X		X	X		BA501	Building Automation System Architecture	X	X		X	X		E121	LIGHTING FLOOR PLAN	X	X		X	X		
G011	PROJECT CLOSEOUT CHECKLIST PHASE 2	X	X		X	X		BA501A	BAS Detail - Existing Equipment	X	X		X	X		E132	GROUNDING FLOOR PLAN SAP	X	X		X	X		
G102	PHASING NOTES	X	X		X	X		BA502	Building Automation System Architecture	X	X		X	X		E301	CONDUIT ROUTING PLAN RAISED FLOOR	X	X		X	X		
ARCHITECTURE								BA503	Building Automation System Architecture	X	X		X	X		E401	ENLARGED POWER PLAN	X	X		X	X		
								BA504	Building Automation System Architecture	X	X		X	X		E402	ENLARGED EQUIPMENT ROOM	X	X		X	X		
								BA514	Building Automation System Details	X	X		X	X		E501	ELECTRICAL DETAILS	X	X		X	X		
	A001	ARCHITECTURAL GENERAL NOTES AND LEGEND	X	X		X	X	BA702	Building Automation NOC ALARMS	X	X		X	X		E502	ELECTRICAL DETAILS	X	X		X	X		
	A110	OVERALL FLOOR PLAN PHASE 2	X	X		X	X	BA705	Building Automation Electrical Points List	X	X		X	X		E503	ELECTRICAL DETAILS	X	X		X	X		
	A200	CONTAINMENT ELEVATIONS PHASE 2	X	X	X	X	X	BA706	Building Automation Electrical Points List	X	X		X	X		E601	MECHANICAL EQUIPMENT SCHEDULES	X	X		X	X		
	A571	FIRE STOPPING DETAILS	X	X		X	X	BA707	Building Automation Electrical Points List	X	X		X	X		E602	LIGHTING FIXTURE SCHEDULE	X	X		X	X		
								M001	Mechanical Legend & Notes	X	X		X	X		E603	PANEL SCHEDULES	X	X		X	X		
EQUIPMENT								M110	Mechanical Overall Floor Plan	X	X		X	X		E604	PANEL SCHEDULES	X	X		X	X		
								M111	Mechanical Floor Plan	X	X		X	X		E605	PANEL SCHEDULES	X	X		X	X		
	Q100	OWNERS EQUIPMENT PLAN PHASE 2	X	X	X	X	X	M120	Mechanical Piping Floor Plan	X	X	X	X	X		E606	PANEL SCHEDULES	X	X		X	X		
	Q503	BATTERY CABLE RACK DETAILS	X	X		X	X	M310	Mechanical Sections	X	X		X	X		E607	PANEL SCHEDULES	X	X		X	X		
	SEISMIC BRACING								M401	Mechanical Enlarged Equipment Yard Plan	X	X		X	X		E608	PANEL SCHEDULES	X	X		X	X	
									M502	Mechanical Details	X	X	X	X	X		E609	PANEL SCHEDULES	X	X		X	X	
		SB001	SEISMIC BRACING NOTES	X	X		X	X	M601	Mechanical Schedules	X	X		X	X		E610	PANEL SCHEDULES	X	X		X	X	
		SB301	SEISMIC BRACING DETAILS	X	X		X	X	M602	Existing Mechanical Schedules	X	X		X	X		E700	ELECTRICAL SCHEDULES	X	X		X	X	
SB501		SEISMIC BRACING DETAILS	X	X		X	X	M603	Existing Mechanical Schedules	X	X		X	X		E701	ELECTRICAL ONE LINE DIAGRAM	X	X		X	X		
SB502		SEISMIC BRACING DETAILS	X	X		X	X	M604	Existing Mechanical Schedules	X	X		X	X		E702	ELECTRICAL ONE LINE DIAGRAM	X	X		X	X		
SB601		SEISMIC BRACING SCHEDULES	X	X		X	X	M605	Existing Mechanical Schedules	X	X		X	X		E703	ELECTRICAL ONE LINE DIAGRAM	X	X		X	X		
								M701	Mechanical Airflow Diagram	X	X		X	X		E704	ELECTRICAL ONE LINE DIAGRAM	X	X	X	X	X		
																E800	GROUNDING ONE LINE DIAGRAM		X		X			
								FIRE PROTECTION																
								FP001	Fire Protection Notes & Legends	X	X		X	X										
								FP101	Overall Fire Protection De-Powering Plan	X	X		X	X										
								FP110	Overall Fire Protection Plan	X	X		X	X										
								FP121	Fire Detection Plan	X	X	X	X	X										
								FP601	Fire Protection Schedules	X	X	X	X	X										



05-29-2020

[illegible]

NOTE:
CONSTRUCTION SHALL BE PER THE VERIZON WIRELESS STANDARDS LISTED ABOVE AND DETAILED IN THESE DRAWINGS. COMPLIANCE WITH LOCAL CODES AS LISTED ON SHEET G003 IS ALSO REQUIRED. IN THE EVENT OF A CONFLICT, THE MORE STRINGENT CODE OR STANDARD SHALL APPLY.

NOTE:
CONSTRUCTION SHALL BE PER THE VERIZON WIRELESS STANDARDS LISTED ON THIS SHEET AND AS DETAILED IN THESE DRAWINGS. COMPLIANCE WITH LOCAL CODES AS LISTED ON SHEET G003 IS ALSO REQUIRED. IN THE EVENT OF A CONFLICT, THE MORE STRINGENT CODE OR STANDARD SHALL APPLY.

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verizon[✓]
WESTBOROUGH MEC PHASE 2
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

PROJECT NO:	200132400	STAMP
CAD DWG FILE:	200132400	
DESIGNED BY:	-	
DRAWN BY:	-	
CHECKED BY:	-	
COPYRIGHT:	MARCH 2015	

VZW STANDARDS REQUIREMENTS

G010

APPROVED PROJECT DEVIATIONS FROM NETWORK STANDARDS					
#	APPROVED DATE	STANDARD		DESCRIPTION: THE CHARACTER OF THE DEVIATION AS IT RELATES TO THIS PROJECT. APPROVED DEVIATIONS DO NOT SUPERCEDE ANY AUTHORITY HAVING JURISDICTION REQUIREMENTS.	APPROVED BY HQ EOS STAFF
		NUMBER	SECTION		
				NONE	

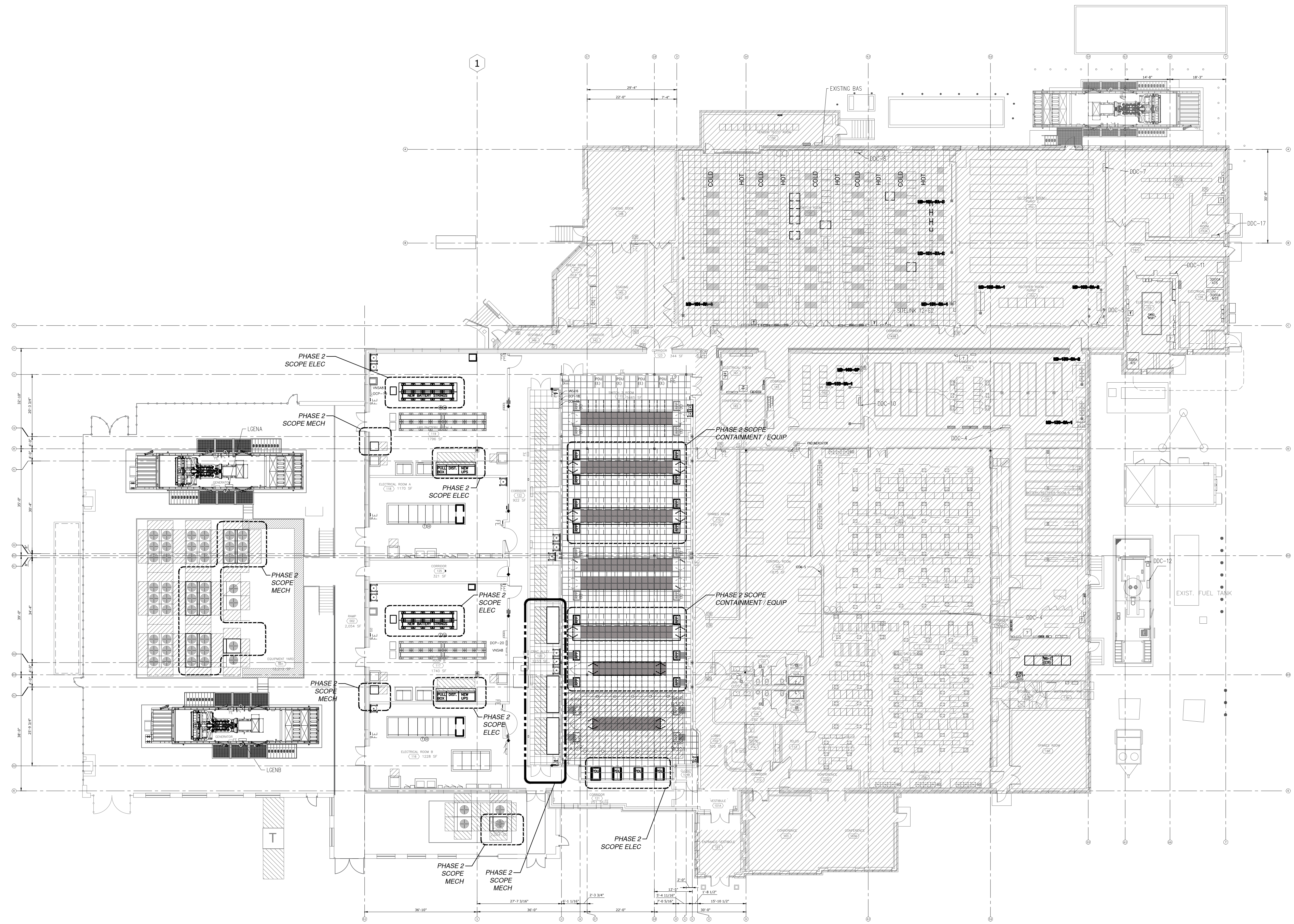
PROJECT CLOSE-OUT CHECK LIST									
SPEC SECTION	ITEM	REQUIREMENTS							
		SHOP DWG	PROD. DATA	TEST	REPORT	FACTORY REP SUPER- VISION AT SITE	TRAINING REQUIRED AT SITE	EXTRA MATERIAL	O&M'S
	LIEN RELEASES (REQUIRED FOR PROJECT CLOSEOUT)								
	CONTRACTOR AS-BUILT DRAWINGS (REQUIRED FOR PROJECT CLOSEOUT)								
	CONTACT LIST								X
	CERTIFICATE OF OCCUPANCY								X
	FINAL CERTIFICATIONS								X
	CONTRACTORS PUNCH LIST COMPLETED								X
	ARCHITECTURAL PUNCH LIST COMPLETED								X
	MECHANICAL PUNCH LIST COMPLETED								X
	ELECTRICAL PUNCH LIST COMPLETED								X
	WARRANTIES AND GUARANTEES								X
	TRAINING SCHEDULE AND SIGN-OFF BY VZW								X
	CERTIFICATE OF SUBSTANTIAL COMPLETION								X
SHEET	CONCRETE FORMING AND ACCESSORIES	X							
SHEET	CONCRETE REINFORCING	X							
SHEET	CAST-IN-PLACE CONCRETE	X	X	X	X				
055000	METAL FABRICATIONS	X	X						X
078413	PENETRATION FIRESTOPPING								
230500	COMMON WORK RESULTS FOR HVAC								
230513	COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT	X	X	X	X				X
230548	VIBRATION AND SEISMIC CONTROL FOR HVAC PIPING AND EQUIPMENT	X	X						X
230553	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT		X						
230593	TESTING, ADJUSTING AND BALANCING FOR HVAC			X	X				
230700	HVAC INSULATION	X	X						
230800	COMMISSIONING OF HVAC			X	X		X	X	X
238123	COMPUTER ROOM AIR-CONDITIONERS (CRACS)	X	X			X	X	X	X
250002	BAS GENERAL MSI	X	X	X	X	X	X	X	X
251101	BUILDING AUTOMATION MATERIALS, IO, DEVICES, AND SENSORS	X	X	X	X	X	X	X	X
251202	THIRD PARTY INTERFACES FOR BUILDING AUTOMATION - MSI	X	X	X	X	X	X	X	X
251302	BUILDING AUTOMATION NETWORK ELECTRONICS - MSI	X	X	X	X	X	X	X	X
251402	BAS FIELD PANELS MSI	X	X	X	X	X	X	X	X
251502	BAS SOFTWARE AND PROGRAMMING - MSI	X	X	X	X	X	X	X	X
259001	SEQUENCE OF OPERATIONS FOR BUILDING AUTOMATION	X	X	X	X	X	X	X	X
260500	COMMON WORK RESULTS FOR ELECTRICAL	X	X			X	X	X	X
260519	LOW VOLTAGE ELECTRICAL POWER CONDUCTOR AND CABLES	X	X	X	X				X
260526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS	X	X	X	X				X
260529	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	X	X						X
260533	RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS		X						X
260548	VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS		X	X	X	X		X	X
260553	IDENTIFICATION FOR ELECTRICAL SYSTEM								
260800	COMMISSIONING OF ELECTRICAL SYSTEM			X	X		X	X	X
262600	POWER DISTRIBUTION UNIT		X	X	X	X	X	X	
262610	REMOTE POWER PANEL		X	X	X	X	X	X	
262716	ELECTRICAL CABINETS AND ENCLOSURES	X	X						X
262726	WIRING DEVICES	X	X	X					X
262816	ENCLOSED SWITCHES AND CIRCUIT BREAKERS	X	X	X				X	X
263353	STATIC UPS	X	X	X	X	X	X	X	X
263354	UPS BATTERIES	X	X	X	X	X	X	X	X
269000	TESTING			X	X			X	X
280500	COMMON WORK RESULTS FOR ELECTRICAL								
280513	CONDUCTORS FOR CABLES AND ELECTRICAL		X						X



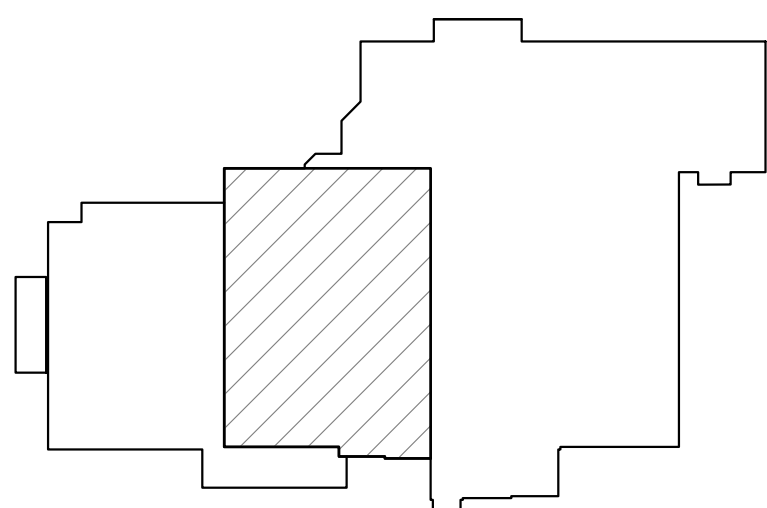
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<div style="display: flex; align-items: center;"> <div> MORRISON HERSHFIELD MISSION CRITICAL 1455 LINCOLN PARKWAY, SUITE 500 ATLANTA, GA 30346 TEL: 770.379.8500 FAX: 770.379.8501 WWW.MORRISONHERSHFIELD.COM </div> </div>		
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 <h1 style="margin: 0;">WESTBOROUGH MEC PHASE 2</h1> <h2 style="margin: 0;">400 FRIBERG PARKWAY WESTBOROUGH, MA 01581</h2>		
Δ REV	DESCRIPTION	DATE
-		
-		
-		
-		
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-		
NETWORK COMPLIANCE SUBMITTALS		DATE
	ISSUED FOR EOS REVIEW	03.06.2020
	ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
	REISSUED FOR CONSTRUCTION	04.16.2020
	ISSUED FOR BUILDING PERMIT	05.29.2020
PROJECT NO:	200132400	STAMP 05-29-2020
CAD DWG FILE:	200132400	
DESIGNED BY:	-	
DRAWN BY:	-	
CHECKED BY:	-	
COPYRIGHT:	MARCH 2015	
SHEET TITLE		
ARCHITECTURAL GENERAL NOTES AND LEGEND		
SHEET NUMBER		
A001		



1 OVERALL FLOOR PLAN
A110 SCALE : 1/16" = 1'-0"

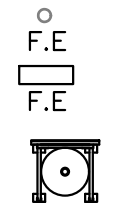


KEY PLAN

SHEET NOTES

1. SEE SHEETS Q100 FOR ALL EQUIPMENT, EQUIPMENT DIMENSIONAL LOCATIONS AND REQUIRED CLEARANCES.
2. ALL CONSTRUCTION MATERIALS SHALL BE NON COMBUSTIBLE (CLASS A FLAME SPREAD) AND FIRE RETARDANT TREATED WOOD.

LEGEND

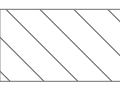


BRACKET MOUNTED FIRE EXTINGUISHER

SEMI-RECESSED FIRE EXTINGUISHER CABINET

CLEAN AGENT TANK

WORKING CLEARANCE PER NEC



ACCESS CLEARANCE

— — — SCOPE OF WORK LIMIT LINE

===== EXISTING CONSTRUCTION TO REMAIN.



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1455 LINCOLN PARKWAY, SUITE 500
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WESTBOROUGH MEC PHASE 2
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

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NETWORK COMPLIANCE SUBMITTALS	DATE
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SHEET TITLE

OVERALL FLOOR PLAN
PHASE 2

SHEET NUMBER

A110



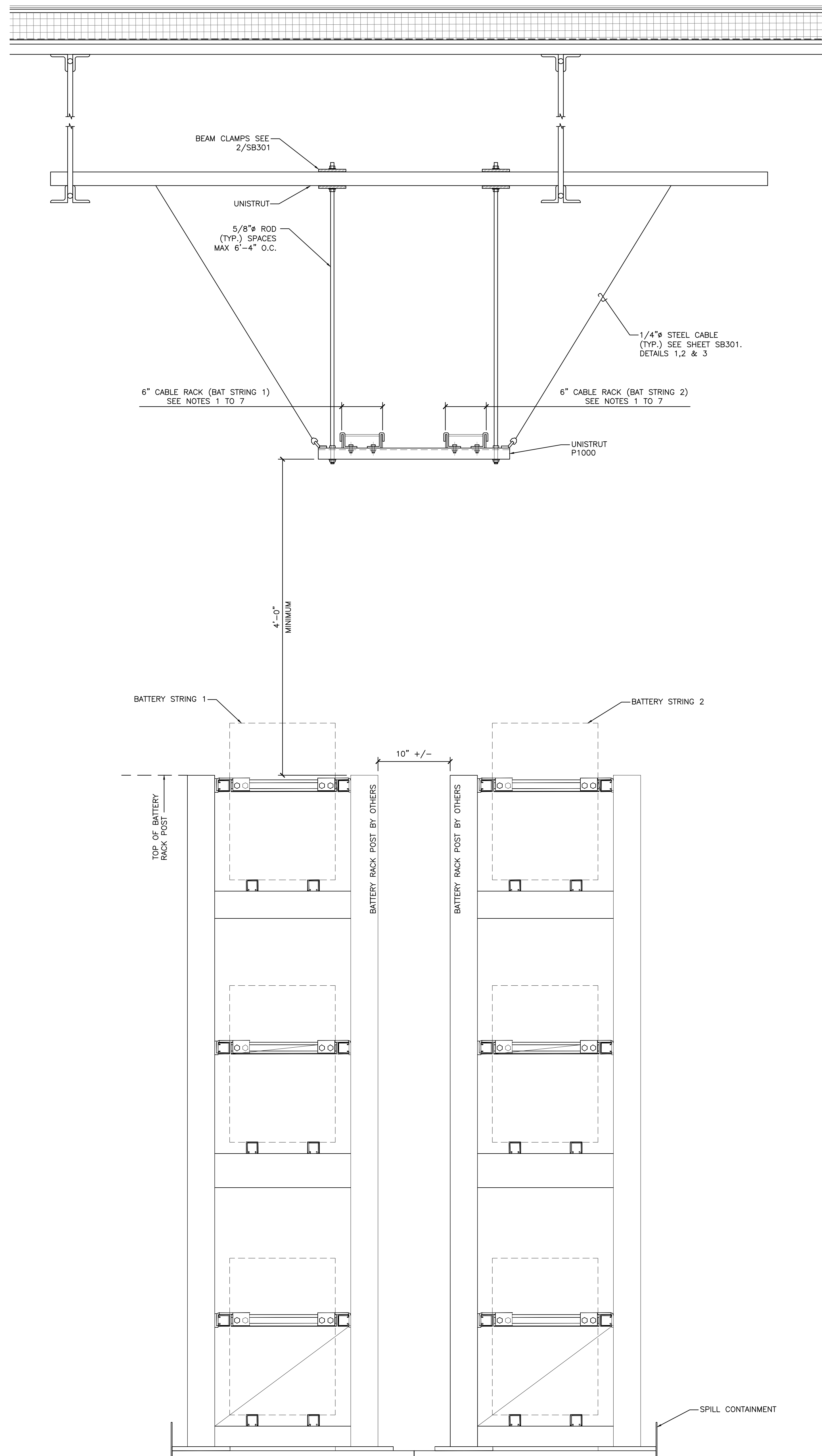
SHEET NOTES

1. CONFIRM WITH V2W QUANTITY AND LOCATION OF ALL PARTNER EQUIPMENT CABINETS ANTICIPATED TO BE PRESENT AT TIME OF CONTAINMENT INSTALLATION.
2. CONFIRM WITH CG QUANTITY AND LOCATION OF ALL ELECTRICAL EQUIPMENT (RPP) ANTICIPATED TO BE PRESENT AT TIME OF CONTAINMENT INSTALLATION.
3. ALL EXISTING CONDITIONS IMPACTING THE CONTAINMENT SYSTEM ARE TO BE VERIFIED IN FIELD BY THE CONTAINMENT SUPPLIER.
4. REFERENCE GENERAL NOTES AND GENERAL CONSTRUCTION NOTES FOR INFORMATION REGARDING PROTECTION OF EXISTING ADJACENT CONSTRUCTION / EQUIPMENT.
5. REFERENCE GENERAL NOTES AND GENERAL CONSTRUCTION NOTES FOR V2W PROCEDURES WHEN WORKING IN A LIVE FACILITY.

Δ	REV	DESCRIPTION	DATE
	1	ISSUED WITH BULLETIN No. 1	04.16.20
	-		
	-		
	-		
	-		

NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
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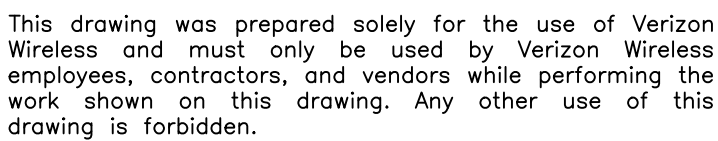


NEW CABLE RACKS

1. PROVIDE (2) NEW 6 INCH CABLE RACK THE FULL LENGTH OF THE (2) NEW BATTERY STRUNG RACKS
2. CABLE RACK SHALL BE 6 INCH WIDE WITH SLOPE 3/8 INCH THICK X 2 INCH RAILS, PAINTED GRAY OR YELLOW DYE. RAILS SHALL BE 1/4 INCHES ON CENTER. SPRUCE CABLE RACK SECTIONS PER NSTD119 WITH CONTINUITY CLIPS OR CLIPS WITH #6 JUMPERS.
3. ATTACH CABLE RACK TO UNISTRUT SUPPORTS WITH "CABLE RACK TO WALL CLIPS", NEWTON FIG 002078 OR EQUAL
4. WATERFALL IS NEEDED IF BATTERY CABLES ARE UNSUPPORTED FOR A DISTANCE GREATER THAN 2'.
5. CONSTRUCT RACK FROM UNISTRUT P-1000 USING 3/8 INCH HARDWARE.
6. DRILL NEW BATTERY RACK POST BEFORE ASSEMBLING THE BATTERY RACK IN PLACE. NEW HOLES MAYBE OVERSIZED TO 3/4 INCH DIAMETER AND DRILLED THROUGH BOTH FACES FOR THRU BOLTS.
7. ALL HARDWARE SHALL BE GALVANIZED OR YELLOW PLATED.

NOTES

1. REFER TO SB001 FOR BRACING NOTES
2. REFER TO 1/Q100 FOR PLAN VIEW.



1455 LINCOLN PARKWAY, SUITE 500
ATLANTA, GA 30346
TEL:770.379.8500 FAX:770.379.8501
WWW.MORRISONHERSHFIELD.COM

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[illegible]

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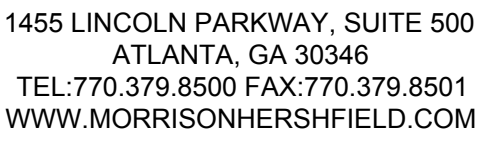
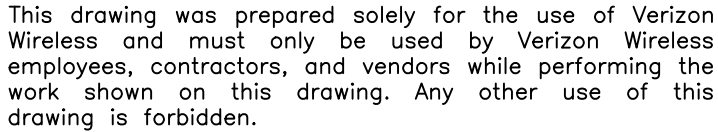
SHEET TITLE

BATTERY CABLE RACK DETAILS

SHEET NUMBER

Q503

BRACING FOR MEP DUCTS AND PIPES		SEISMIC BRACING GENERAL NOTES
<ol style="list-style-type: none"> 'SB' SERIES SHEETS APPLY TO VERTICAL AND HORIZONTAL SUPPORTS OF ALL MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DUCTS AND CONDUITS. HORIZONTAL BRACING IS PROVIDED TO RESIST LATERAL LOADS INCLUDING BUT NOT LIMITED TO SEISMIC FORCES. SEISMIC BRACING SHALL COMPLY WITH THE FOLLOWING: <ul style="list-style-type: none"> 2009 INTERNATIONAL BUILDING CODE (REFER TO SECTION 1631 EARTHQUAKE LOADS. ASCE 7-05 CHAPTER 13 (REFER TO FORMULAS 13.3.1, 13.3-2 2009 INTERNATIONAL BUILDING CODE CHAPTER 17 STRUCTURAL TESTS AND SPECIAL INSPECTIONS ALL ANCHORS UTILIZED AS PART OF THE COMPONENT ANCHORAGE AND /OR SEISMIC ANCHORAGE MUST COMPLY WITH SECTION 13.4.2 OF THE ASCE 7-05. ALL ANCHORS MUST BE TESTED FOR SEISMIC APPLICATIONS IN CONFORMANCE WITH ACI 355.2. ALL MECHANICAL, ELECTRICAL, COMPONENTS AND SYSTEMS SHALL BE CONSIDERED A 'DESIGNATED SEISMIC SYSTEM PER CHAPTER 17 OF THE 2009 IBC. CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A DESIGNATED SEISMIC SYSTEM SHALL SUBMIT A WRITTEN 'STATEMENT OF RESPONSIBILITY', PER THE 2009 IBC (SECTION 1706), TO THE BUILDING OFFICIAL AND VZW PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. 		<ol style="list-style-type: none"> THIS PROJECT SHALL INCLUDE A CONTRACTOR SUPPLIED SEISMIC DESIGN FOR ALL SEISMIC RESTRAINTS ASSOCIATED WITH ELECTRICAL, MECHANICAL, FIRE PROTECTION, PLUMBING, AND HVAC SYSTEMS. SEISMIC RESTRAINT ASSOCIATED WITH THE VERIZON WIRELESS SUPPLIED NETWORK EQUIPMENT INCLUDING OVERHEAD RACKING WILL BE PROVIDED BY OTHERS. CABLE RACKING IS THE PREFERRED METHOD. BUT THIS MUST BE REVIEWED BASED UPON APPLICATION. SEISMIC RESTRAINT CABLES THROUGH WALLS ARE NOT PERMITTED. SEISMIC DESIGN CRITERIA FOR THIS FACILITY PER 2009 IBC AND ASCE 7-05 IS AS FOLLOWS: <ol style="list-style-type: none"> BASIC BUILDING LATERAL FORCE RESISTING SYSTEM: SEE STRUCTURAL GENERAL NOTES BUILDING OCCUPANCY CATEGORY: SEE STRUCTURAL GENERAL NOTES SEISMIC DESIGN CATEGORY: SEE STRUCTURAL GENERAL NOTES DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIOD, Sds: 0.300 DESIGN SPECTRAL RESPONSE ACCELERATION AT 1-SECOND PERIOD, Sd1: 0.098 SEISMIC BASE SHEAR, V: SEE STRUCTURAL GENERAL NOTES SEISMIC COEFFICIENTS FOR NONSTRUCTURAL BUILDING COMPONENTS: <ul style="list-style-type: none"> COMPONENT RESPONSE MODIFICATION FACTOR, Rp: REFER TO ASCE-7 05, TABLE 13.5-1 & 13.6-1 COMPONENT AMPLIFICATION FACTOR, ap: REFER TO ASCE-7 05, TABLE 13.5-1 & 13.6-1 COMPONENT IMPORTANCE FACTOR, Ip: 1.5 SEISMIC DESIGN SHALL INCLUDE SUBMITTAL OF THE FOLLOWING IN ACCORDANCE WITH THE SPECIFICATIONS: <ol style="list-style-type: none"> PRODUCT DATA FOR THE FOLLOWING: <ol style="list-style-type: none"> INCLUDE RATED LOAD, RATED DEFLECTION, AND OVERLOAD CAPACITY FOR EACH VIBRATION ISOLATION DEVICE. ILLUSTRATE AND INDICATE STYLE, MATERIAL, STRENGTH, FASTENING PROVISION, AND FINISH FOR EACH TYPE AND SIZE OF SEISMIC-RESTRAIN COMPONENT USED. TABULATE TYPES AND SIZES OF SEISMIC RESTRAINTS, COMPLETE WITH REPORT NUMBERS AND RATED STRENGTH IN TENSION AND SHEAR AS EVALUATED BY AN AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION. ANNOTATE TO INDICATE APPLICATION OF EACH PRODUCT SUBMITTED AND COMPLIANCE WITH REQUIREMENTS. RESTRAINED-ISOLATION DEVICES: INCLUDE RATINGS FOR HORIZONTAL, VERTICAL, AND COMBINED LOADS FOR VIBRATION ISOLATION AND SEISMIC-RESTRAINT, DETAILS INDICATED TO COMPLY WITH PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA, INCLUDING ANALYSIS DATA SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION. DESIGN CALCULATIONS: CALCULATE STATIC AND DYNAMIC WADING DUE TO EQUIPMENT WEIGHT AND OPERATION. SEISMIC FORCES REQUIRED TO SELECT VIBRATION ISOLATORS AND SEISMIC RESTRAINTS. COORDINATE DESIGN CALCULATIONS WITH WIND LOAD CALCULATIONS REQUIRED FOR EQUIPMENT MOUNTED OUTDOORS. COMPLY WITH REQUIREMENTS FOR EQUIPMENT MOUNTED OUTDOORS. INDICATE MATERIALS AND DIMENSIONS AND IDENTIFY HARDWARE, INCLUDING ATTACHMENT AND ANCHORAGE DEVICES, FIELD-FABRICATED SUPPORTS, SEISMIC-RESTRAINT DETAILS DESIGN ANALYSIS, TO SUPPORT SELECTION AND ARRANGEMENT OF SEISMIC RESTRAINTS. INCLUDE CALCULATIONS OF COMBINED TENSILE AND SHEAR LOADS. DETAILS: INDICATE FABRICATION AND ARRANGEMENT, DETAIL ATTACHMENTS OF RESTRAINTS TO THE RESTRAINED ITEMS AND TO THE STRUCTURE. SHOW ATTACHMENT LOCATIONS, METHODS, AND SPACING. IDENTIFY COMPONENTS. LIST THEIR STRENGTHS, AND INDICATE DIRECTIONS AND VALUES OF FORCES TRANSMUTED TO THE STRUCTURE DURING SEISMIC EVENTS. COORDINATION DRAWINGS: SHOW COORDINATION OF SEISMIC BRACING FOR ELECTRICAL COMPONENTS WITH OTHER SYSTEMS AND EQUIPMENT IN THE VICINITY, INCLUDING OTHER SUPPORTS AND SEISMIC RESTRAINTS. WELDING CERTIFICATES COMPONENTS / SYSTEMS / PRODUCTS: <ol style="list-style-type: none"> GENERAL REQUIREMENTS FOR RESTRAINT COMPONENTS: RATED STRENGTHS, FEATURE, AND APPLICATION REQUIREMENTS SHALL BE AS DEFINED IN THE ABOVE REFERENCED SUBMITTAL. STRUCTURAL SAFETY FACTOR ALLOWABLE STRENGTH IN TENSION, SHEAR, AND PULLOUT FORCE OF COMPONENTS SHALL BE AT LEAST FOUR TIMES THE MAXIMUM SEISMIC FORCES TO WHICH THEY WILL BE SUBJECTED. SUPPORT SYSTEM, SHOP OR FIELD-FABRICATED SUPPORT ASSEMBLY MADE OF SLOTTED STEEL CHANNELS WITH ACCESSORIES FOR ATTACHMENT TO BRACED COMPONENT AT ONE END AND TO BUILDING STRUCTURE AT THE OTHER END AND OTHER MATCHING COMPONENTS AND WITH CORROSION-RESISTANT COATING; AND RATED IN TENSION, COMPRESSION, AND TORSION FORCE. RESTRAINT CABLES: ASTM A 603 GALVANIZED STEEL CABLES WITH END CONNECTIONS MADE OF STEEL, ASSEMBLIES WITH THIMBLES, BRACKETS, SWIVELS, AND BOLTS DESIGNED FOR RESTRAINING CABLE SERVICE AND WITH A MINIMUM OF TWO CLAMPING BOLTS FOR CABLE ENGAGEMENT. HANGER ROD STIFFENER: STEEL TUBE OR STEEL SLOTTED-SUPPORT-SYSTEM SLEEVE WITH INTERNALLY BOLTED CONNECTIONS OR REINFORCING STEEL ANGLE CLAMPED TO HANGER ROD. DO NOT WELD STIFFENERS TO RODS. BUSHINGS FOR FLOOR-MOUNTED EQUIPMENT ANCHOR: NEOPRENE BUSHINGS DESIGNED FOR RIGID EQUIPMENT MOUNTINGS, AND MATCHED TO TYPE AND SIZE OF ANCHORS AND STUDS. BUSHING ASSEMBLIES FOR WALL-MOUNTED EQUIPMENT ANCHORAGE: ASSEMBLIES OF NEOPRENE ELEMENTS AND STEEL SLEEVES DESIGNED FOR RIGID EQUIPMENT MOUNTINGS, AND MATCHED TO TYPE AND SIZE OF ATTACHMENT DEVICES RESILIENT ISOLATION WASHERS AND BUSHINGS: ONE-PIECE, MOLDED, OIL- AND WATER-RESISTANT NEOPRENE; WITH A FLAT WASHER FACE. MECHANICAL ANCHOR: DRILLED-IN AND STUD-WEDGE OR FEMALE-WEDGE TYPE IN ZINC-COATED STEEL FOR INTERIOR APPLICATIONS AND STAINLESS STEEL FOR EXTERIOR APPLICATIONS. SELECT ANCHORS WITH STRENGTH REQUIRED FOR ANCHOR AND AS TESTED ACCORDING TO ASTM E 488. MINIMUM LENGTH OF EIGHT TIMES DIAMETER. ADHESIVE ANCHOR: DRILLED-IN AND CAPSULE ANCHOR SYSTEM CONTAINING POLYVINYL OR URETHANE METHACRYLATE-BASED RESIN AND ACCELERATOR, OR INJECTED POLYMER OR HYBRID MORTAR ADHESIVE. PROVIDE ANCHOR BOLTS AND HARDWARE WITH ZINC-COATED STEEL FOR INTERIOR APPLICATIONS AND STAINLESS STEEL FOR EXTERIOR APPLICATIONS. SELECT ANCHOR BOLTS WITH STRENGTH REQUIRED FOR ANCHOR AND AS TESTED ACCORDING TO ASTM E 488. INSTALLATION <ol style="list-style-type: none"> CONTRACTOR SHALL EXAMINE AREAS AND EQUIPMENT TO RECEIVE VIBRATION ISOLATION AND SEISMIC-CONTROL DEVICES FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE. CONTRACTOR SHALL EXAMINE ROUGHING-IN OF REINFORCEMENT AND CAST-IN-PLACE ANCHORS TO VERIFY ACTUAL LOCATIONS BEFORE INSTALLATION. CONTRACTOR SHALL PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. APPLICATIONS: <ol style="list-style-type: none"> MULTIPLE RACEWAYS, PIPING, DUCTS, OR CABLES: SECURE TO TRAPEZE MEMBER WITH CLAMPS APPROVED FOR APPLICATION. HANGER ROD STIFFENERS: INSTALL HANGER ROD STIFFENERS WHERE REQUIRED TO PREVENT BUCKLING OF HANGER RODS DUE TO SEISMIC FORCES. STRENGTH OF SUPPORT AND SEISMIC-RESTRAINT ASSEMBLIES: SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC AND SEISMIC LOADS WITHIN SPECIFIED WADING UNITS. SEISMIC-RESTRAINT DEVICE INSTALLATION – EQUIPMENT AND HANGER RESTRAINTS: <ol style="list-style-type: none"> INSTALL RESTRAINED ISOLATORS ON REQUIRED EQUIPMENT. INSTALL RESILIENT, BOLT-ISOLATION WASHERS ON EQUIPMENT ANCHOR BOLTS WHERE CLEARANCE BETWEEN ANCHOR AND ADJACENT SURFACE EXCEEDS 1/8 INCH. INSTALL BUSHING ASSEMBLIES FOR MOUNTING BOLTS FOR WALL-MOUNTED EQUIPMENT, ARRANGED TO PROVIDE RESILIENT MEDIA WHERE EQUIPMENT OR EQUIPMENT-MOUNTING CHANNELS ARE ATTACHED TO WALL. ATTACHMENT TO STRUCTURE: IF SPECIFIC ATTACHMENT IS NOT INDICATED, ANCHOR BRACING TO STRUCTURE AT FLANGES OF BEAMS, AT UPPER TRUSS CHORDS OF BAR JOISTS, OR AT CONCRETE MEMBERS. ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION – INSTALL FLEXIBLE CONNECTIONS IN RUNS OF PIPING, DUCTS, RACEWAYS, CABLES, WIREWAYS, CABLE TRAYS, AND BUSWAYS WHERE THEY CROSS SEISMIC JOINTS, WHERE A ADJACENT SECTIONS OR BRANCHES ARE SUPPORTED BY DIFFERENT STRUCTURAL ELEMENTS, AND WHERE THEY TERMINATE WITH CONNECTION TO EQUIPMENT THAT IS ANCHORED TO A DIFFERENT STRUCTURAL ELEMENT FROM THE ONE SUPPORTING THEM AS THEY APPROACH EQUIPMENT.



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WESTBOROUGH MEC PHASE 2
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WESTBOROUGH, MA 01581

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WESTBOROUGH MEC PHASE 2
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WESTBOROUGH, MA 01581

NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

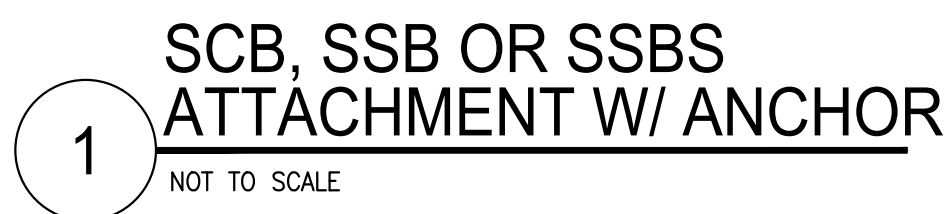
PROJECT NO:	200132400	STAMP
CAD DWG FILE:	SB301R3.d	
DESIGNED BY:		
DRAWN BY:		
CHECKED BY:		
COPYRIGHT:	MARCH 2015	

SEISMIC BRACING DETAILS


SB301

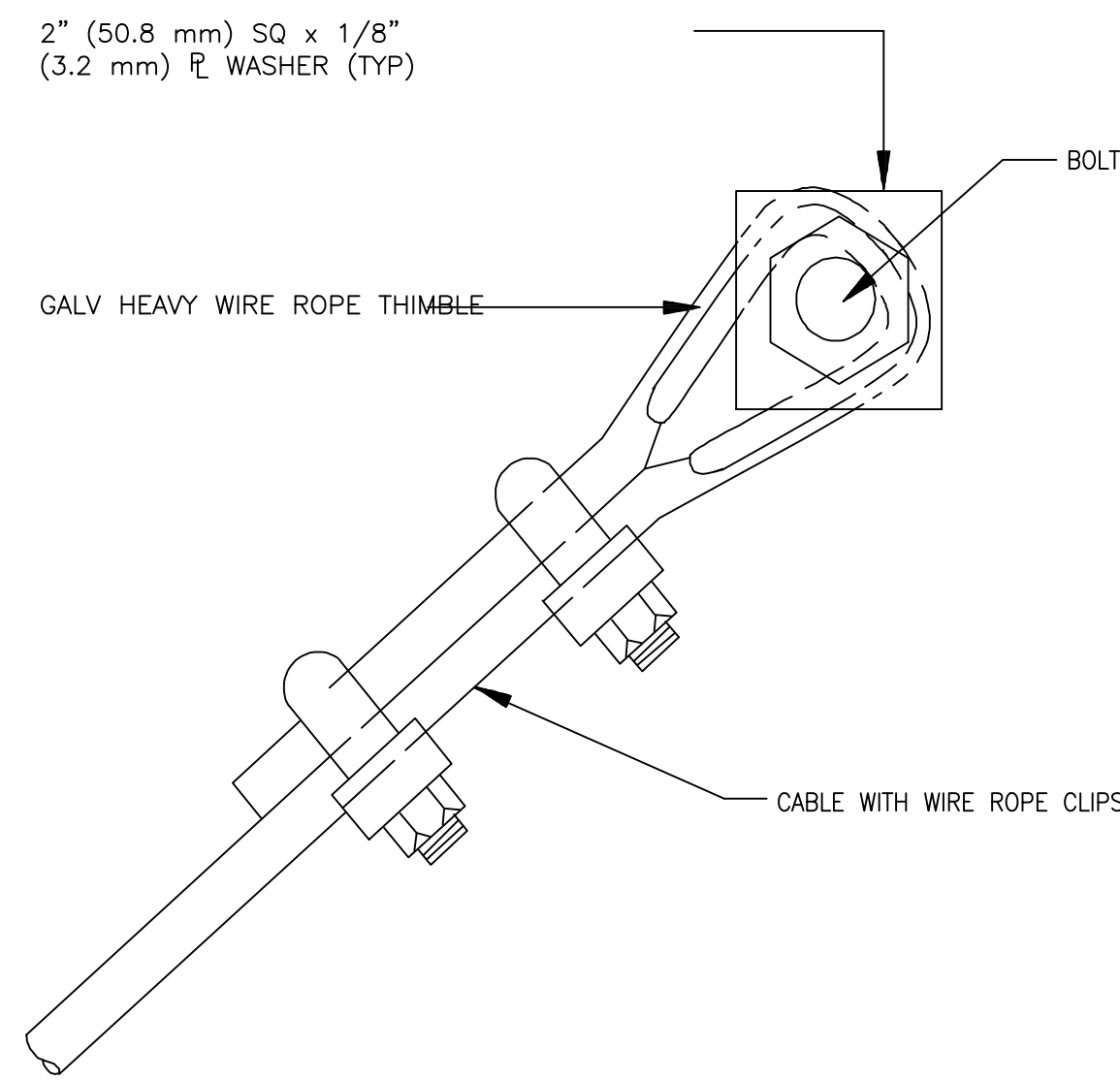


3 BRACING DETAIL

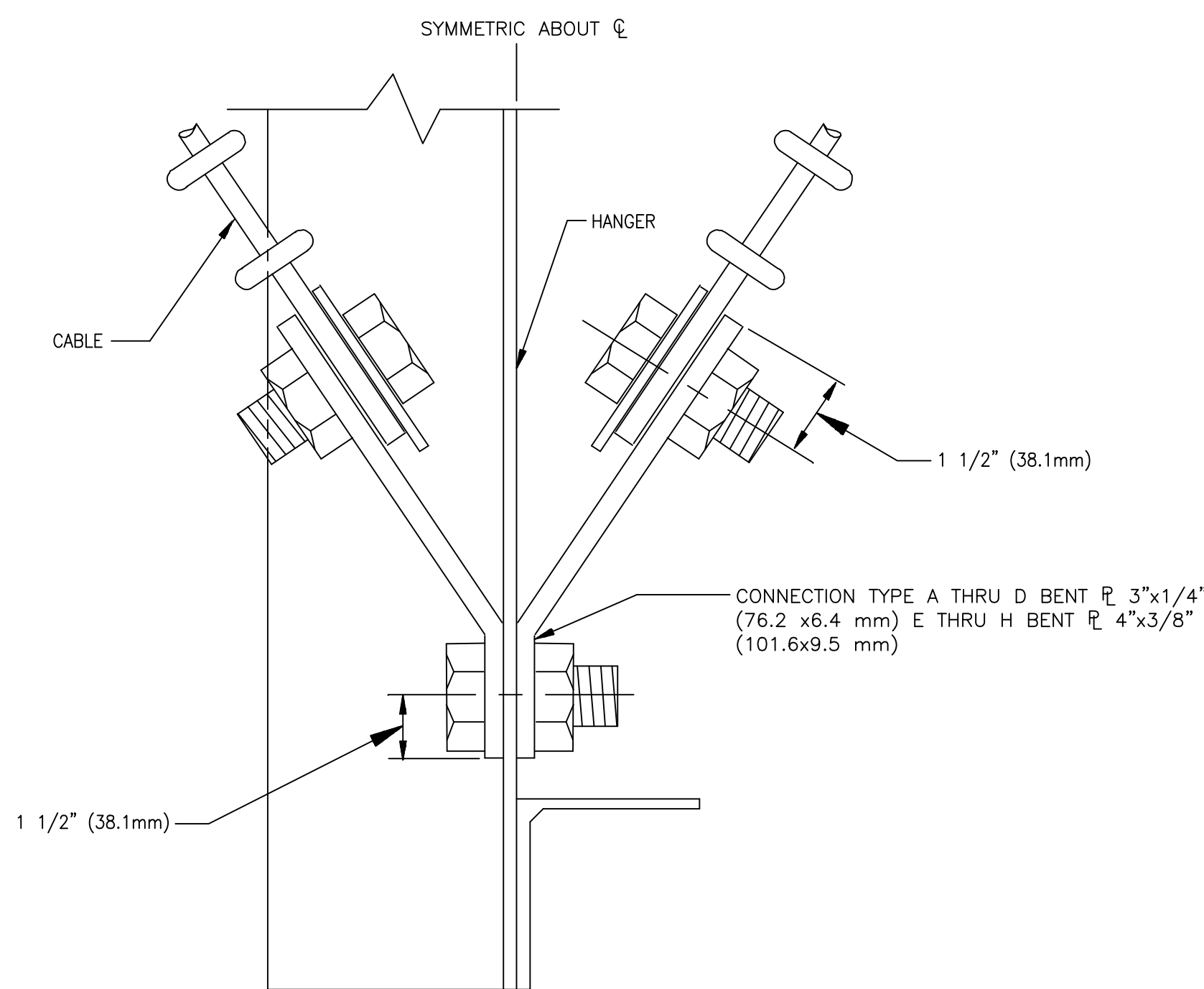
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NETWORK COMPLIANCE SUBMITTALS	DATE
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PROJECT NO:	200132400	STAMP
CAD DWG FILE:	SB501R3.d	
DESIGNED BY:		
DRAWN BY:		
CHECKED BY:		
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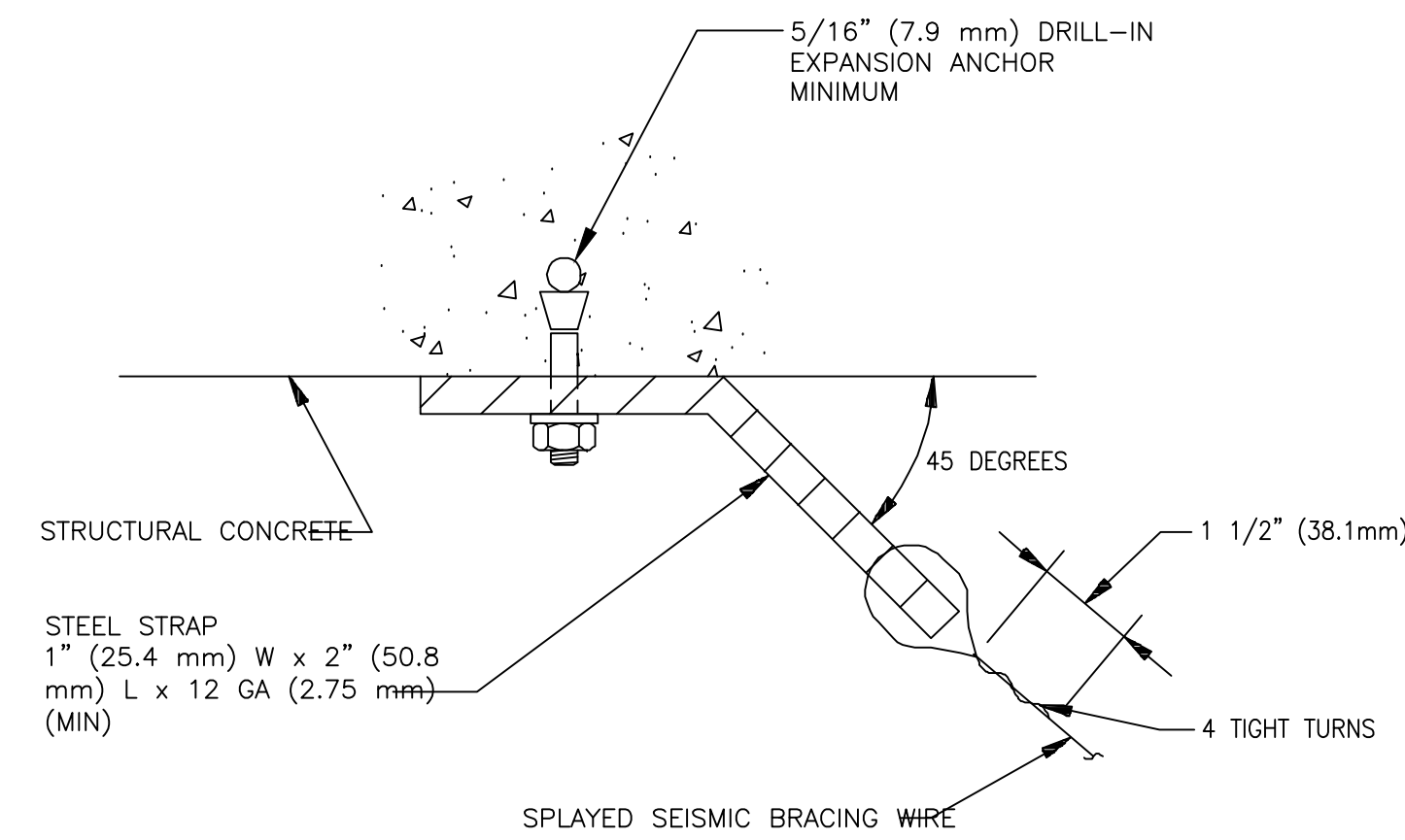


1 CABLE END CONNECTION



4 LONGITUDINAL
CABLE CONNECTION
TO DUCT HANGER

NOT TO SCALE

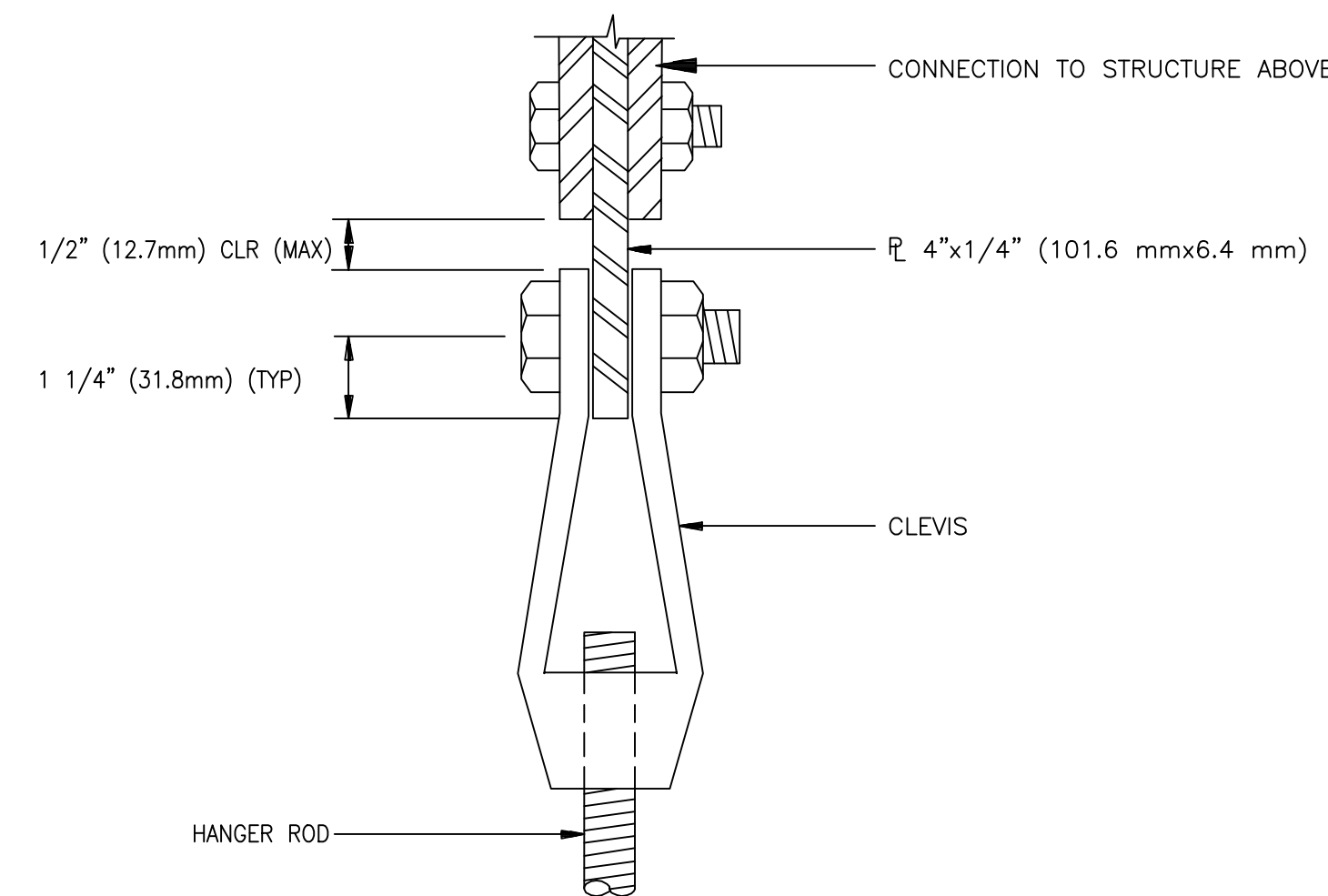


NOTES:

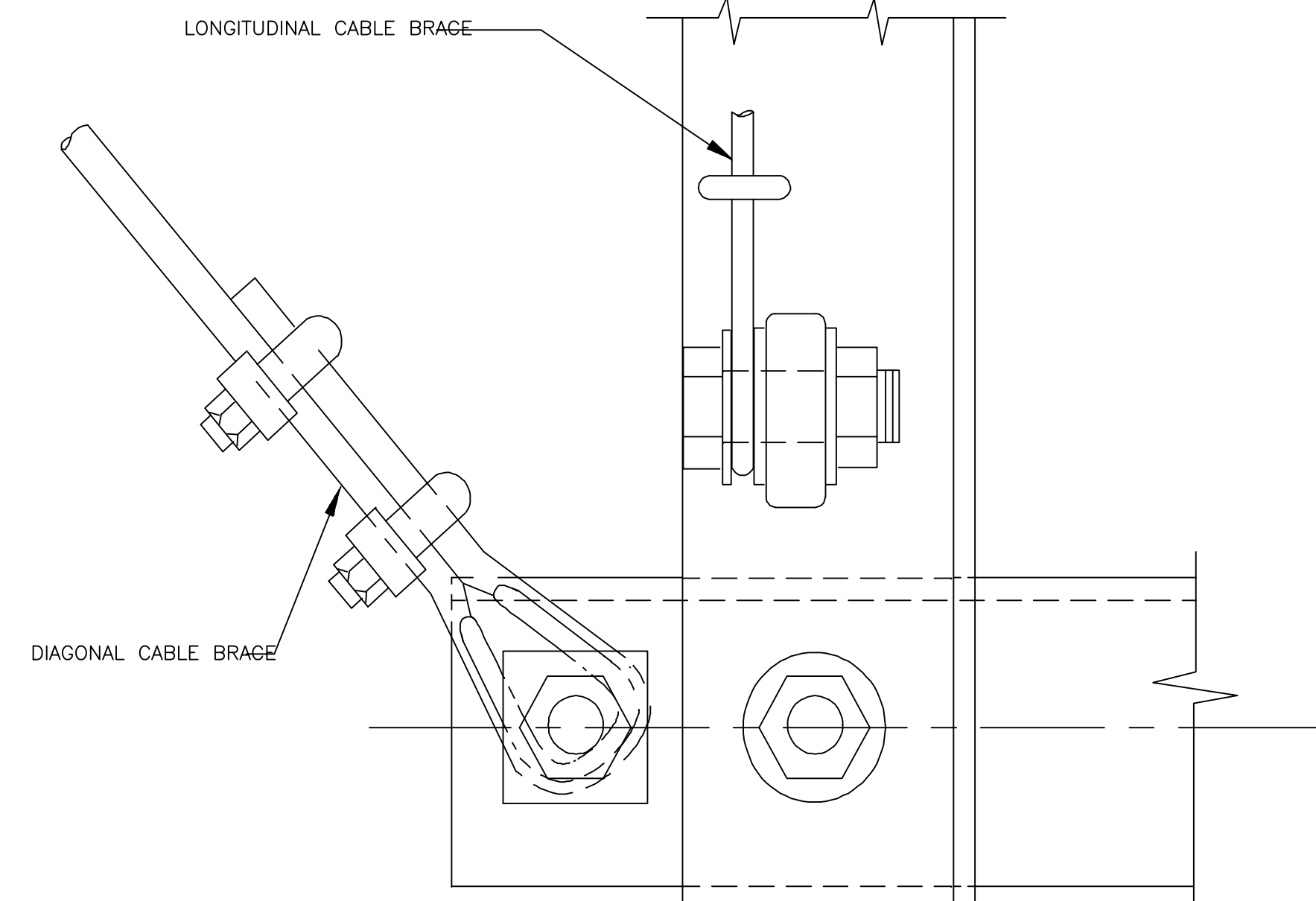
1. OTHER CONNECTIONS MAY BE USED WHERE INFORMATION IS PROVIDED BY THE MANUFACTURER.
2. HANGER WIRES SHALL BE SECURED WITH 3 TIGHT TURNS. BRACING WIRES SHALL BE SECURED WITH 4 TIGHT TURNS.

BRACING WIRE PARALLEL TO TRUSS

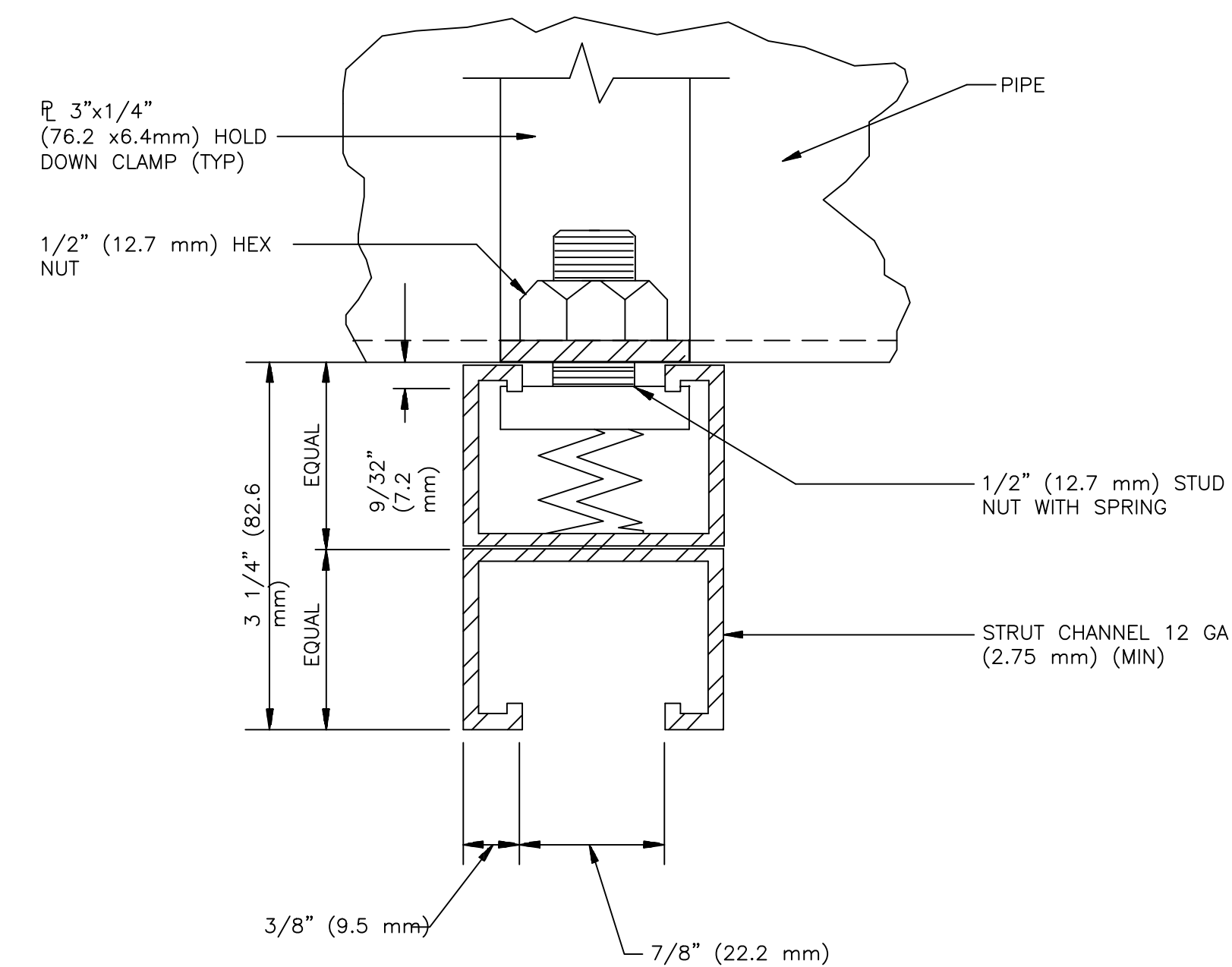
2 ACCEPTABLE WIRE CONNECTIONS TO STRUCTURE



5 HANGER ROD CONNECTIONS



3 CABLE CONNECTIONS TO DUCT FRAME



NOTES:

1. MAKE CERTAIN THAT PIPE IS CLAMPED TIGHTLY BY HOLD DOWN CLAMP.
2. SEE APPENDIX B FOR OSHPD REQUIREMENTS.

6 CONNECTIONS FOR PIPE ON TRAPEZE

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[illegible]

ABBREVIATIONS

ACH	AIR CHANGES PER HOUR	PRESS	PRESSURE
AFF	ABOVE FINISHED FLOOR	PRV	PRESSURE REDUCING VALVE
APPROX	APPROXIMATE	RA	RETURN AIR
ARCH	ARCHITECT	RD	ROOF DRAIN
BI	BACKWARD INCLINED	RECIRC	RECIRCULATION
BLDG	BUILDING	REG	REGISTER
BTUH	BRITISH THERMAL UNIT/HOUR	REQD	REQUIRED
CB	CATCH BASIN	RH	RELATIVE HUMIDITY
C/C	CENTER TO CENTER	RI	ROUGH-IN
CF	CUBIC FEET/MINUTE	RM	ROOM
CIRC	CIRCULATOR	RP	REDUCED PRESSURE PRINCIPLE
CLG	CEILING	BACKFLOW ASSEMBLY	
CO	CLEAN OUT	RPM	REVOLUTIONS/MINUTE
CONTR	CONTRACTOR	SCH	SCHEDULE
CSP	CONCRETE SLEW PIPE	SH	STATIC HEAD
DB	DRY BULB TEMPERATURE	SM	SHEETMETAL
DF	DRINKING FOUNTAIN	SPEC	STATIC PRESSURE
DIA	DIAMETER	SO	SPECIFICATIONS
DM	DIMENSION	SQFT	SQUARE FOOT
DN	DOWN	SS	STAINLESS STEEL
DWG	DRAWING	STD	STANDARD
EA	EXHAUST AIR	STRUCT	STRUCTURE, STRUCTURAL
ELECT	ELECTRICAL	SW	SWITCH
ENGR	ENGINEER	TB	THRUST BLOCK
EQUIP	EQUIPMENT	TD	TEMPERATURE DIFFERENCE
ESP	EXTERNAL STATIC PRESSURE	TDH	TOTAL DYNAMIC HEAD
EXH	EXHAUST	TEMP	TEMPERATURE
FA	FAHRENHEIT	THRU	THROUGH
FC	FROM ABOVE	TMTR	THERMOMETER
FF	FINISHED FLOOR	TSP	TOTAL STATIC PRESSURE
FD	FORWARD CURVED	TSTAT	THERMOSTAT
FL	FLOOR DRAIN	TYP	TYPICAL
FFE	FINISHED FLOOR ELEVATION	VEL	VELOCITY
FLR	FLOOR	VFD	VARIABLE FREQUENCY DRIVE
FPI	FINS PER INCH	VTR	VENT THRU ROOF
FT	FEET PER MINUTE	WB	WET BULB TEMPERATURE
FRP	FIBERGLASS REINFORCED PLASTIC	WC	WATER COLUMN
GV	FACE VELOCITY		
GA	GAUGE		
GAL	GALLON		
GPM	GALLONS/MINUTE		
GRAV	GRAVITY		
HB	HOSE BIBB		
HQA	HAND-OFF-AUTO		
HP	HORSEPOWER		
HTC	HEATING		
HTR	HEATER		
IE	INVERT ELEVATION		
KW	KILOWATT		
L	POUND		
MAX	MAXIMUM		
MBH	BTUH IN THOUSANDS		
MECH	MECHANICAL		
MFG	MANUFACTURER		
MIN	MINIMUM		
MVD	MANUAL VOLUME DAMPER		
NC	NORMALLY CLOSED		
NMC	NOT IN MECHANICAL		
NO	NORMALLY OPEN		
O/C	ON CENTER		
OFI	OWNER FURNISHED-CONTRACTOR INSTALLED		
OA	OUTSIDE AIR		
OV	OUTLET VELOCITY		
PD	PRESSURE DIFFERENCE		
PF	PLENUM FAN		
PC	PRESSURE CAUSE		
PSD	PUMP SUCTION DIFFUSER		
PSIG	POUNDS/SQUARE INCH, GAUGE		

VENTILATION CALCULATIONS— BATTERY ROOM

BATTERY ROOM VENTILATION CALCULATION

$H_2\text{-RATE} = 2.69 \times 10^{-4} \times I \times N_c$
 WHERE:
 $H_2\text{-RATE}$ = VOLUME OF HYDROGEN (FT³) GAS RELEASED IN
 CFM
 N_c = NUMBER OF CELLS IN PLAN
 I = $C_8 \times .00157$
 I = $P_{15} \times .401$
 C_8 = BATTERY 8 HR AMP RATING TO 1.75 VPC@77°F

I = C_BX.00157
I = 4000X.00157
I = 6.28 AMPS

N= 240 CELLSx2 STRINGS

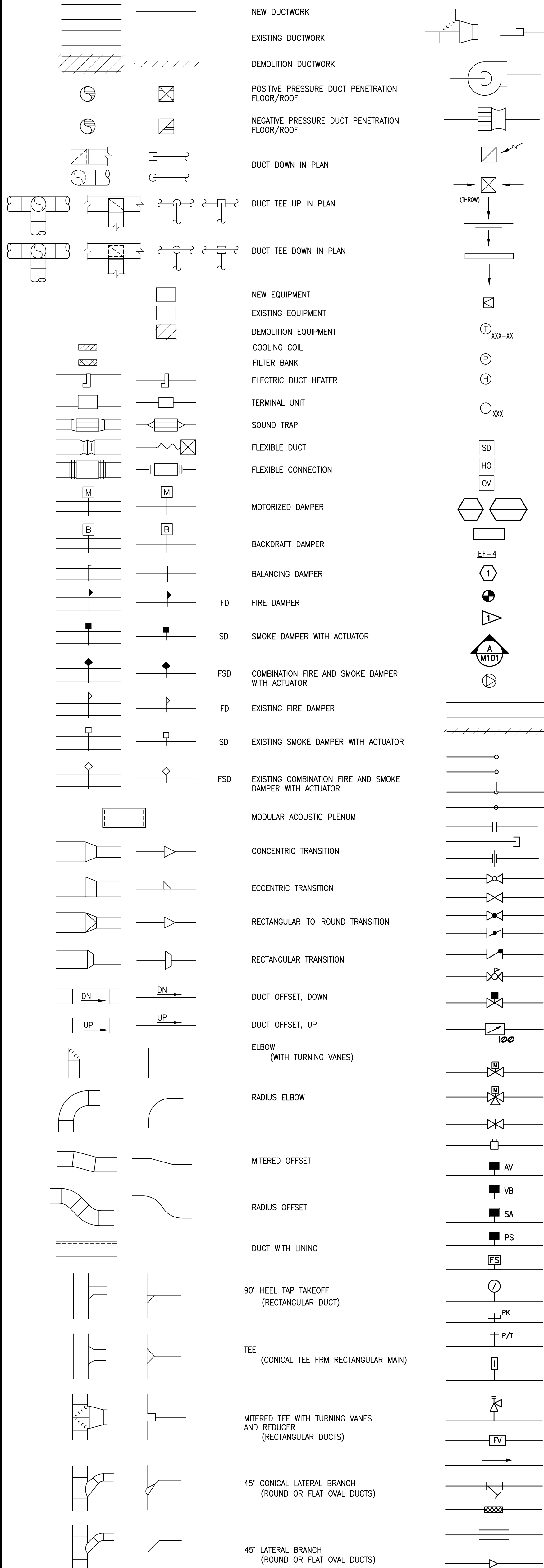
$$H_2\text{-RATE} = 2.69 \times 10^{-4} \times 6.28 \text{ AMPS} \times 240 \text{ CELLS} \times 2 \text{ STRINGS}$$

$H_2-RATE = .8108$

TO OBTAIN EXHAUST AIR REQUIRED PER HOUR (CFM) TO MAINTAIN
MAXIMUM HYDROGEN BUILD UP OF 1%, DIVIDE 'H₂-RATE'
VALUE BY 1%.

.8108/.01 = 81 FT³/MIN (CFM) REQUIRED.
150 CFM PROVIDED.

MECHANICAL LEGEND



PROJECT SCOPE AND RFP

THE PROJECT SCOPE OF WORK THAT THE CONTRACTOR SHALL BE RESPONSIBLE FOR IS DEFINED BY RFP NO: _____ REQUEST FOR PROPOSAL FOR _____ AND INCLUDES THE FOLLOWING ATTACHMENTS: _____

ATTACHMENT A M/W/DV BE QUESTIONNAIRE.
ATTACHMENT B PROPOSED AGREEMENT.
ATTACHMENT C BID PROPOSAL. COST BREAKDOWN.
ATTACHMENT D PROJECT MANUAL (DRAWINGS AND SPECIFICATIONS).
ATTACHMENT E OTHER RELATED BID DOCUMENTS.
ATTACHMENT F VERIZON NETWORK STANDARDS.
PROJECT ADDENDUMS AND CLARIFICATIONS.

THE RFP AND ALL ASSOCIATED ATTACHMENTS AND DOCUMENTS SHALL DEFINE THE COMPLETE PROJECT SCOPE OF WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL DOCUMENTS AND IS SOLELY RESPONSIBLE FOR ALL WORK.

ALL DOCUMENTS INCLUDED WITHIN THE PROJECT REQUEST FOR PROPOSAL ARE REQUIRED FOR THE COMPLETE PROJECT SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK (EQUIPMENT, MATERIAL, INSTALLATION, TESTING, ETC.) INDICATED IN ALL DOCUMENTS. THE RFP, ATTACHMENT A M/W/D/VBE CERTIFICATION, ATTACHMENT B PROPOSAL FORM, ATTACHMENT C PROPOSAL FORM, ATTACHMENT D PROJECT MANUAL (DRAWINGS AND SPECIFICATIONS), ATTACHMENT E OTHER RELATED BID DOCUMENTS, ATTACHMENT F VERIZON NETWORK STANDARDS AND PROJECT ADDENDUMS AND CLARIFICATIONS ARE COMPLEMENTARY TO EACH OTHER. THE CSI FORMAT OF THE SPECIFICATIONS AND DRAWING NUMBERING PER DISCIPLINE IS NOT INTENDED TO IMPLY SEGREGATION OF SUB CONTRACTOR WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK AND VERIZON WILL NOT ACCEPT ANY CHANGE ORDER FOR INTERNAL CONTRACTOR WORK ASSIGNMENTS.

CONTRACTOR SHALL BE RESPONSIBLE FOR DISTRIBUTING ALL RFP DOCUMENTS TO THEIR SUB CONTRACTORS. ALL RFP DOCUMENTS ARE REQUIRED TO INDICATE THE PROJECT SCOPE OF WORK. PARTIAL SUBCONTRACTOR DOCUMENT PACKAGES ARE HIGHLY DISCOURAGED.

THE DRAWINGS, SPECIFICATIONS, REFERENCED STANDARDS, VERIZON WIRELESS STANDARDS, OTHER RFP ATTACHMENTS AND THE TERMS AND CONDITIONS ARE COMPLEMENTARY OF ONE ANOTHER. IN THE EVENT OF CONFLICT BETWEEN THE DRAWINGS, SPECIFICATIONS, REFERENCED STANDARDS, VERIZON WIRELESS STANDARDS, OTHER RFP ATTACHMENTS OR TERMS AND CONDITIONS, THE ARCHITECT / ENGINEER SHALL BE CONTACTED FOR FORMAL INTERPRETATION OF THE REQUIREMENT. THE CONTRACTOR SHALL BE DEEMED TO HAVE PROVIDED THE MOST DETAILED AND EXPENSIVE INTERPRETATION OF THE REQUIREMENT. ANY WORK INSTALLED IN CONFLICT WITH THE ARCHITECT / ENGINEER INTERPRETATION SHALL BE CORRECTED BY THE CONTRACTOR AT HIS EXPENSE AND AT NO EXPENSE TO OWNER.

ASSIGNMENT OF WORK: THE AGREEMENT BETWEEN THE CONTRACTOR AND THE OWNER IS A SINGLE PRIME CONTRACT. THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE SCOPE OF WORK INCLUDING THE COORDINATION OF SUBCONTRACTORS. THE CONSTRUCTION DOCUMENTS DO NOT DELINEATE BETWEEN SUBCONTRACTORS AND ANY INFERENCE TO DIVISION OF WORK IS A SUGGESTION ONLY. NEITHER THE OWNER NOR THE ARCHITECT / ENGINEER WILL OFFER, AT ANY TIME, ANY OPINIONS OR PROPOSED RESOLUTIONS CONCERNING ASSIGNMENT OF WORK TO SUBCONTRACTORS. IN THE EVENT OF MISSING OR CONFLICTING SCOPE PROVIDED BY THE CONTRACTOR OR ANY OF THE SUBCONTRACTORS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE WORK.

MECHANICAL GENERAL NOTES

1. **COORDINATION:**
A. EACH DIVISION SHALL COMPLY WITH THE G001 PROJECT GENERAL NOTES AS IF CONTAINED HEREIN.
B. CONTRACTOR SHALL SUBMIT COORDINATION DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ASSEMBLY AND COORDINATION OF WORK WITHIN ALL DIVISIONS AND TRADES INTO A SINGLE PACKAGE.
2. **DO NOT SCALE DRAWINGS:**
THE CONTRACTORS SHALL USE DIMENSIONS SHOWN ON THE DRAWINGS AND ACTUAL FIELD MEASUREMENT. NOTIFY THE ASR PROJECT MANAGER IF ANY DISCREPANCIES ARE FOUND PRIOR TO PROCEEDING WITH WORK.
3. FIRESTOPPING SHALL BE PROVIDED PER G AND A SHEET REQUIREMENTS.
4. ALL CONDUIT, CABLE, PIPING, AND OTHER MECHANICAL / ELECTRICAL SYSTEMS NOT ASSOCIATED WITH SPECIFIC CRITICAL EQUIPMENT SPACES (E.G. SWITCHROOM, ADJUNCT, TELCO, CONTROL ROOM, RECTIFIER, BATTERY ETC.) SHALL BE ROUTED AROUND SUCH SPACES IN CORRIDORS OR UNDERSLAB AND NOT THROUGH THESE SPACES.
5. PROVIDE TURNING VANES IN ALL ELBOWS THAT CHANGE THE AIR FLOW DIRECTION MORE THAN 30 DEGREES OR USE RADIUS ELBOWS.
6. ALL DUCTWORK CONNECTIONS TO AIR HANDLING UNITS, EXHAUST FANS, AND GENERATORS SHALL BE FLEXIBLE CONNECTIONS, IN ACCORDANCE WITH ASHRAE, IMC, ETC..
7. ALL MOTORIZED DAMPERS SHALL BE LOW LEAKAGE AIRFOIL AMCA CLASS 1A DAMPERS.
8. ALL DUCTWORK SHALL BE SEALED IN ACCORDANCE WITH ASHRAE, IMC, ETC..
9. DDC CONTRACTOR TO PROVIDE AND INSTALL CONTROL WIRING AND CONDUIT PER DIVISION 26. PROVIDE FOR ALL VAV CONTROLLERS, UNIT CONTROLLERS VFD'S, MOTORIZED DAMPERS AND FIRE/SMOKE DAMPERS.
10. COORDINATE APPROPRIATE CORRESPONDING DAMPER SIZE WITH DUCT SIZE, SEE SPECIFICATIONS.
11. CONDENSATE AND HUMIDIFIER PIPING ABOVE SENSITIVE EQUIPMENT OR RUNNING THROUGH EQUIPMENT SPACES SHALL BE IN CONTAINMENT PIPING.
12. ALL CONDENSATE PIPING SHALL SLOPE $\frac{1}{8}"$ PER 1'-0".
13. PROVIDE SECONDARY DRAIN PAN AND PIPING UNDER FAN COIL UNITS.
14. VERIFY ALL DIMENSIONS & CONDITIONS IN THE FIELD. NOTIFY ASR PROJECT MANAGER OF ANY DISCREPANCIES. DRAWINGS ARE DIMENSIONAL AND DO NOT SHOW ALL OFFSETS, BENDS, ELBOWS, ETC., WHICH MAY BE REQUIRED FOR PROPER INSTALLATION OF WORK. PROVIDE ADDITIONAL BENDS AND/OR OFFSETS AS REQUIRED TO COMPLETE WORK AT NO ADDITIONAL COST.
15. COORDINATION OF WORK WITH OTHER TRADES EMPLOYED IN THE PROJECT IS MANDATORY. CAREFULLY EXAMINE THE SPACE AVAILABLE TO DETERMINE FINAL ROUTING AND ELEVATIONS OF SERVICES. SHOULD REARRANGEMENT OR RE-ROUTING OF LINES OR PIPING BE NECESSARY, PROVIDE FOR APPROVAL THE SIMPLEST LAYOUT POSSIBLE FOR THAT PARTICULAR PORTION OF THE WORK.
16. THE EXISTENCE OF ANY PIPING, DUCTS OR OTHER SERVICE FACILITIES ARE SHOWN IN A GENERAL WAY ONLY. THE CONTRACTOR SHALL VISIT THE SITE AND MAKE EXACT DETERMINATION OF THE EXISTENCE OF ANY SUCH FACILITIES PRIOR TO THE SUBMISSION OF HIS BID.
17. ALL TELECOMMUNICATIONS EQUIPMENT TO REMAIN ON-LINE AND FUNCTIONING AT ALL TIMES. CONTRACTOR TO PROTECT & MAINTAIN POWER TO ALL EQUIPMENT SCHEDULED TO REMAIN FOR THE DURATION OF CONSTRUCTION.
18. SCHEDULE ALL WORK OVER, NEAR OR AFFECTING NETWORK EQUIPMENT WITH VZW ON-SITE WORK FORCE PERSONNEL. COMPLETE "METHODS OF PROCEDURE" FOR WORK AS DIRECTED BY VZW IN ACCORDANCE WITH VZW STANDARDS.
19. CONTRACTOR TO REMOVE ALL MATERIALS NOT RELATED TO THE FINISHED PRODUCT FROM THE SITE. (DO NOT BURY ON SITE).
20. MAINTAIN AREAS FREE OF DEBRIS ACCUMULATION. KEEP WORK AREAS NEAT AND ORDERLY IN AS MUCH AS REASONABLY POSSIBLE.
21. CONTRACTOR IS RESPONSIBLE FOR ALL ERECTION, BRACING & SHORING OF EXISTING AND NEW EQUIPMENT OR MATERIALS UNTIL SUCH TIME IT IS PERMANENTLY SUPPORTED OR IS READY FOR REMOVAL DURING CONSTRUCTION, WHETHER SCHEDULED FOR DEMOLITION OR REUSE.
22. PROVIDE EQUIPMENT PROTECTION ABOVE ALL NETWORK EQUIPMENT AS REQUIRED. ALL PROTECTION SHALL BE COORDINATED WITH VZW PERSONNEL TO ENSURE THAT THE PROTECTION WILL NOT BLOCK ACCESS TO EQUIPMENT OR CAUSE OVER HEATING. PROVIDE TEMPORARY COOLING AS REQUIRED. CONTRACTOR TO SUBMIT DESIGN OF ALL TEMPORARY DUST BARRIERS TO ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION.
23. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE SITE AND DETERMINE THE EXACT EXTENT OF WORK, COORDINATION, DEMOLITION, TEMPORARY CONSTRUCTION, TEMPORARY FACILITIES, UTILITIES, ETC. NECESSARY TO COMPLETE THIS PROJECT AS INDICATED IN THE CONTRACT DOCUMENTS.
24. CONTRACTOR SHALL PROVIDE SEISMIC BRACING AND SUPPORT OF ALL EQUIPMENT AND MATERIALS PROVIDED. SEE SB SHEETS FOR DETAILS.
25. LINED DUCT PROHIBITED IN EQUIPMENT AREAS.

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Δ REV	DESCRIPTION	DATE
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+		
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-		

NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

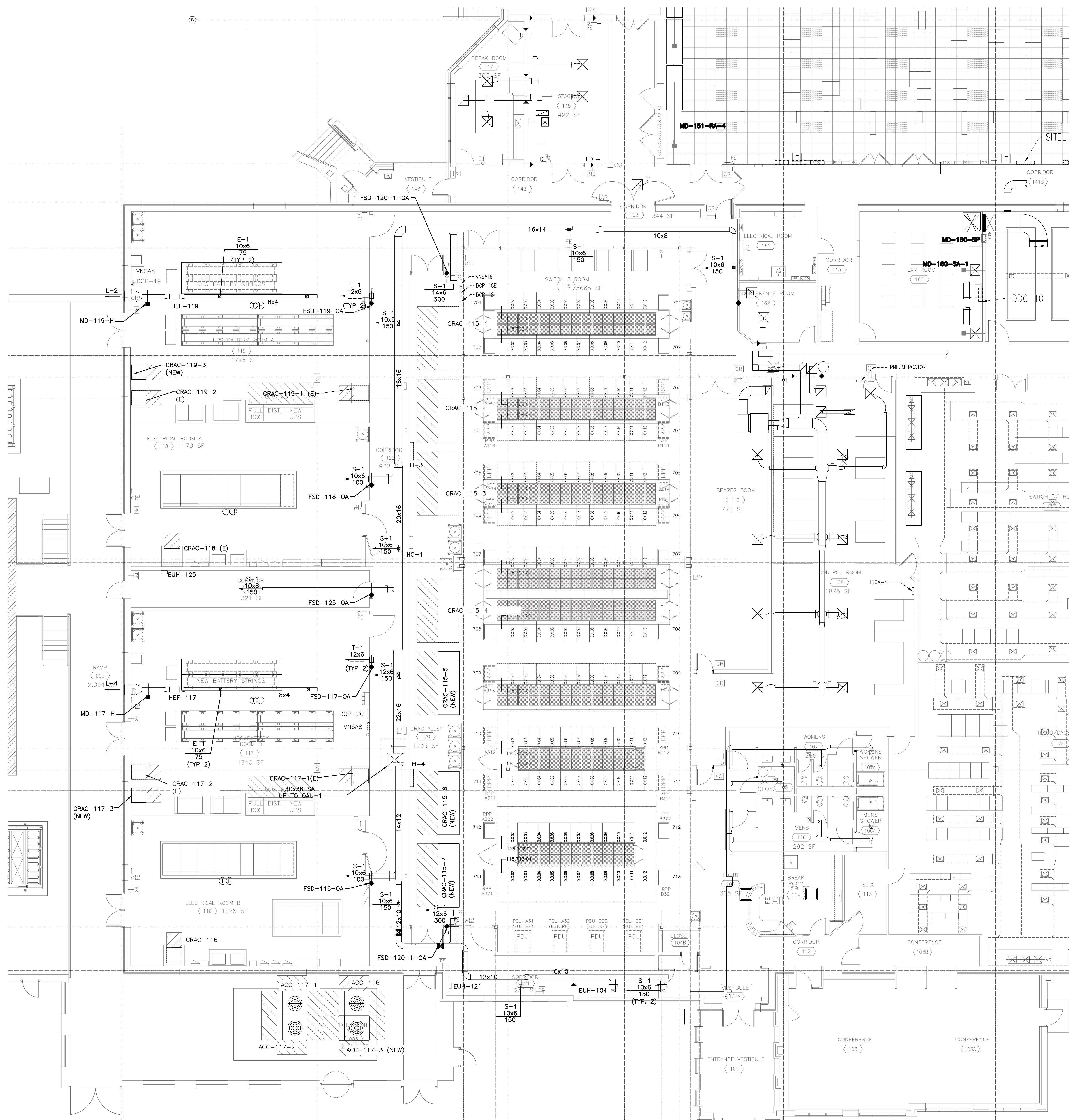
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SHEET TITLE

MECHANICAL LEGEND & NOTES

SHEET NUMBER

M001



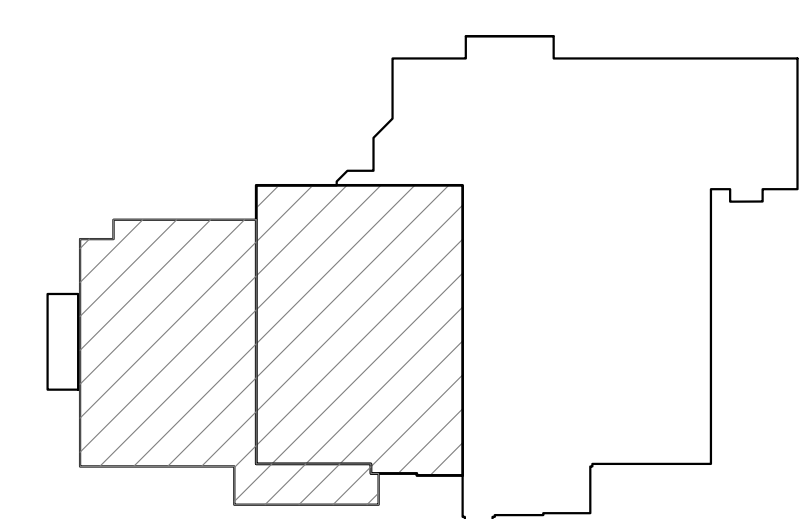
MECHANICAL FLOOR PLAN

1
M111

SCALE: 1/8" = 1'-0"

8 0 8

NORTH



KEY PLAN

GENERAL NOTES:

1. REFER TO SHEET M001 FOR GENERAL MECHANICAL REQUIREMENTS.
2. CONTRACTOR TO MAINTAIN NEC CLEARANCE, EQUIPMENT SERVICE ACCESS CLEARANCE, AND OTHER AREA CLEARANCES AS SHOWN.
3. CONTRACTOR TO COORDINATE ALL POWER AND CONTROL WIRING WITH OTHER TRADES AND ENSURE ALL REQUIREMENTS ARE INCLUDED IN SCOPE OF BID FOR A COMPLETE AND OPERABLE SYSTEM.
4. DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL OFFSETS, BENDS, ELBOWS, ETC. WHICH MAY BE REQUIRED FOR PROPER INSTALLATION OF EQUIPMENT AND DUCTWORK. CONTRACTOR TO PROVIDE ALL NECESSARY BENDS, OFFSETS, AND CONNECTIONS, AS REQUIRED, TO ACCOMPLISH INSTALLATION AS PART OF THEIR BID AND INITIAL SCOPE OF WORK.

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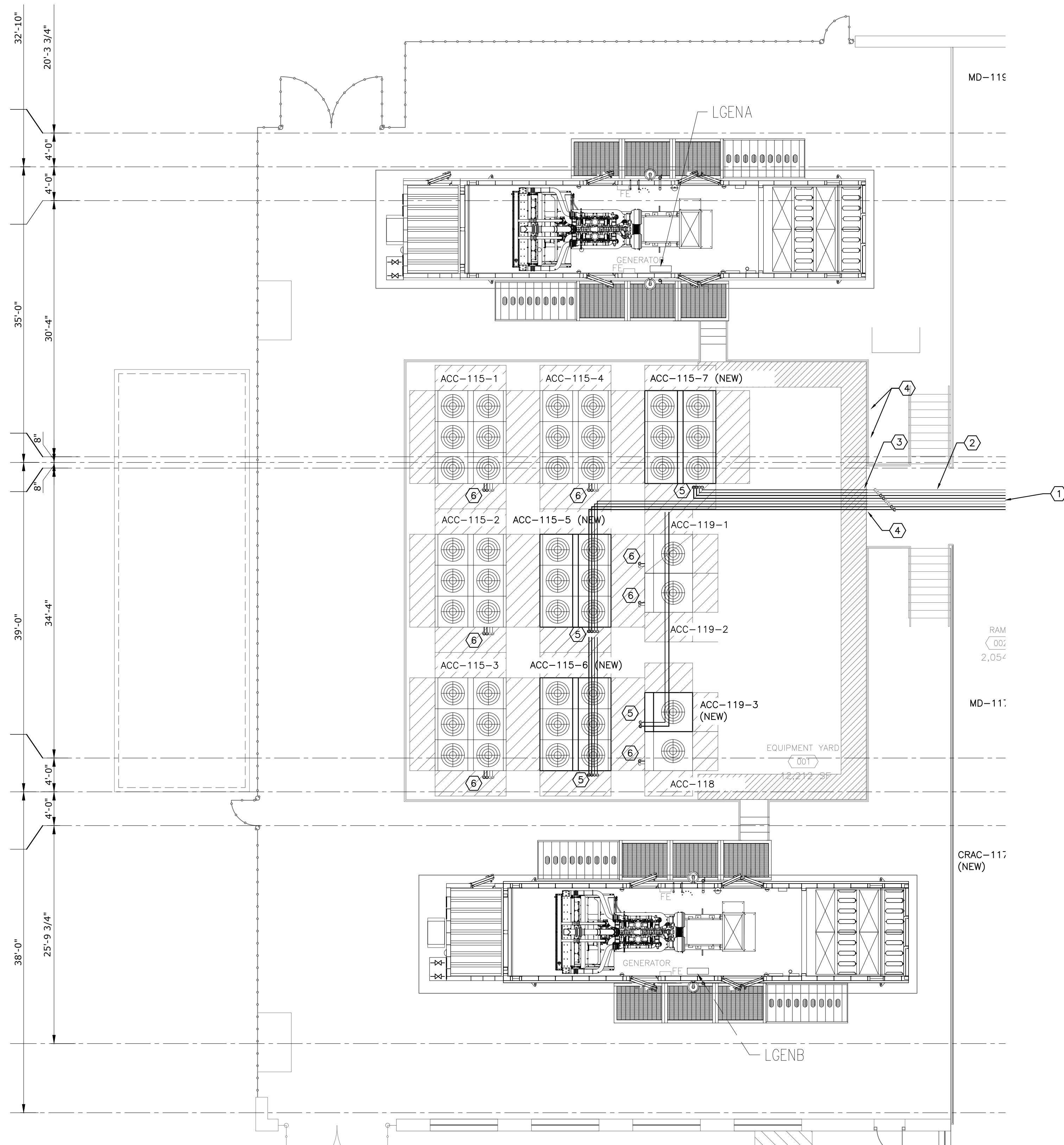
1. REFER TO SHEET M001 FOR GENERAL MECHANICAL REQUIREMENTS.
2. CONTRACTOR TO MAINTAIN NEC CLEARANCE, EQUIPMENT SERVICE ACCESS CLEARANCE, AND OTHER AREA CLEARANCES AS SHOWN.
3. CONTRACTOR TO COORDINATE ALL POWER AND CONTROL WIRING WITH OTHER TRADES AND ENSURE ALL CLEARANCE REQUIREMENTS ARE INCLUDED IN SCOPE OF BID FOR A COMPLETE AND OPERABLE SYSTEM.
4. PROVIDE AND INSTALL FIRE DAMPERS AS INDICATED AT ALL RATED PARTITIONS.
5. DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL OFFSETS, BENDS, ELBOWS, ETC., WHICH MAY BE REQUIRED FOR PROPER INSTALLATION OF EQUIPMENT AND DUCTWORK. CONTRACTOR TO PROVIDE ALL NECESSARY BENDS, OFFSETS, AND CONNECTIONS, AS REQUIRED, TO ACCOMPLISH INSTALLATION AS PART OF THEIR BID AND INITIAL SCOPE OF WORK.

- ① NEW CRAC UNIT.
- ② EXISTING 16x20 OUTSIDE AIR DUCT.
- ③ ROUTE REFRIGERANT PIPING UP TO PIPING SUPPORT.
- ④ PIPING SUPPORT. SEE 2/A330 FOR SUPPORT SECTION AND ELEVATIONS.
- ⑤ REFRIGERANT PIPING.

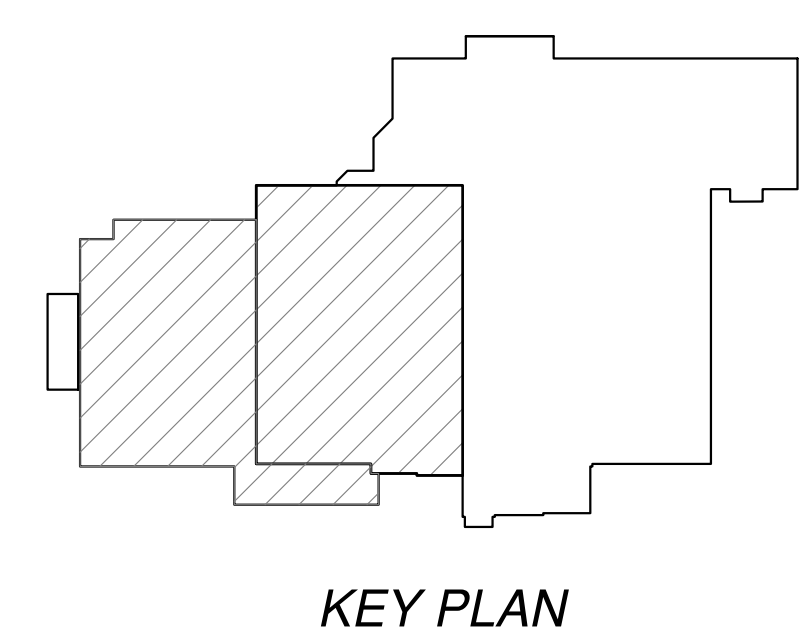
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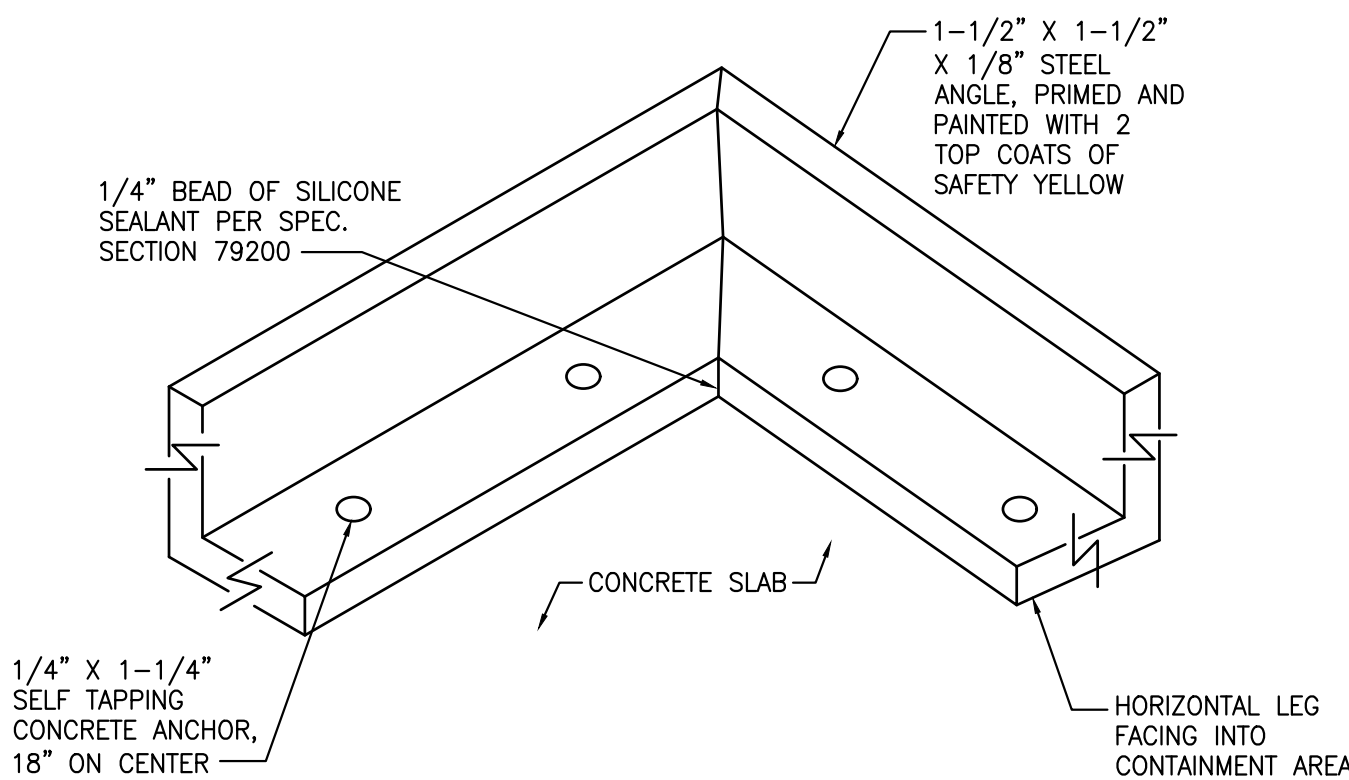
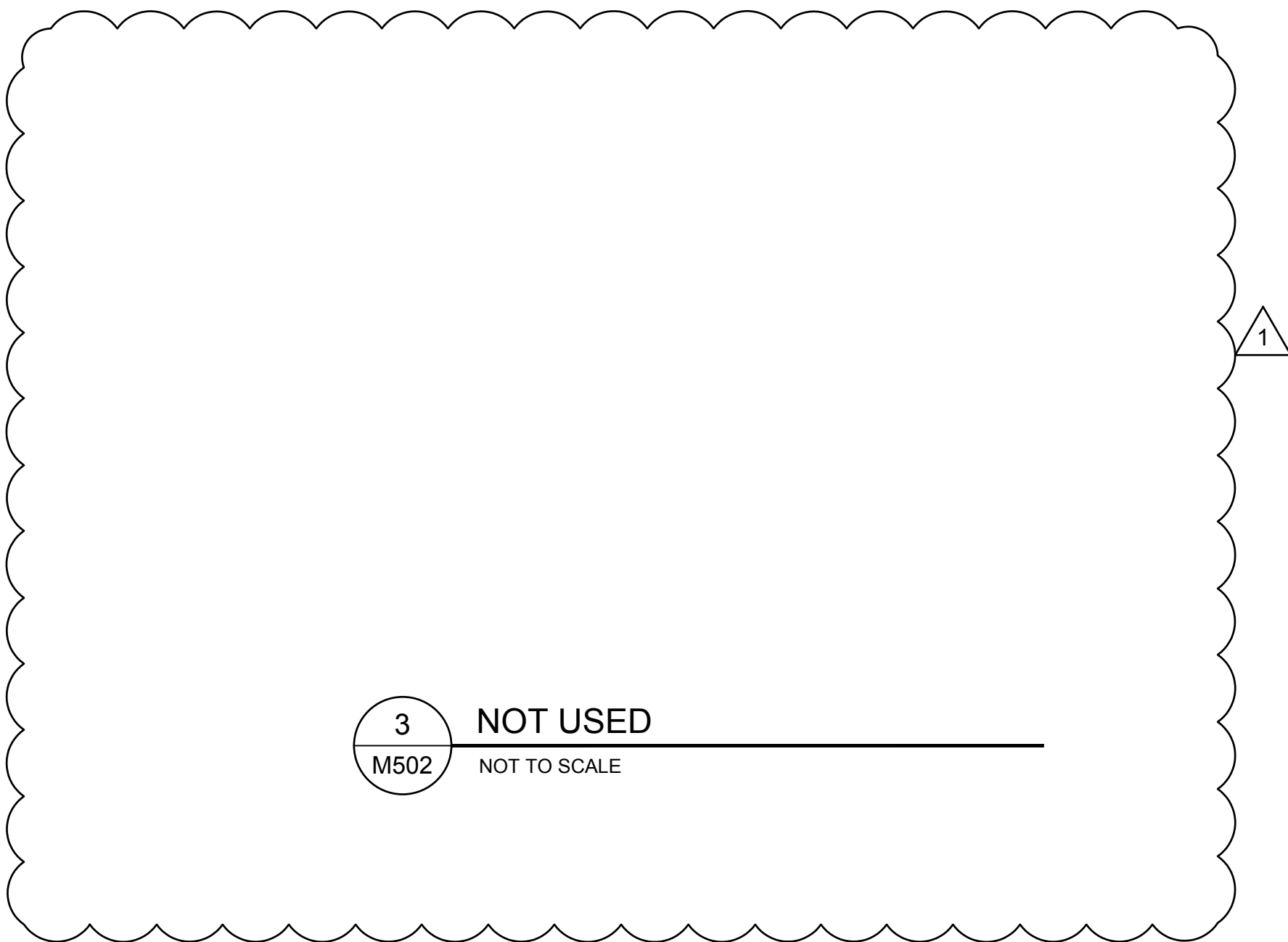
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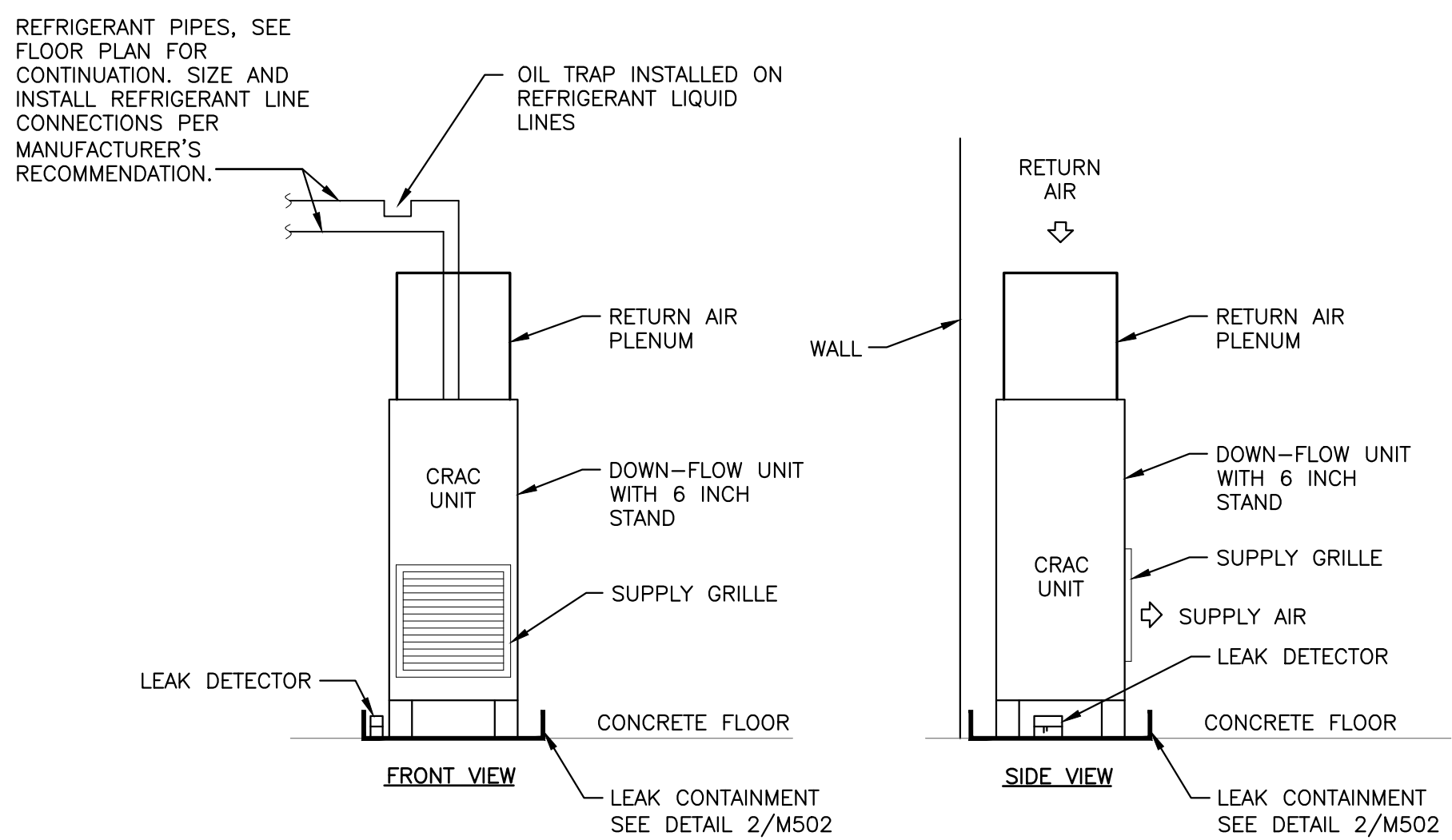
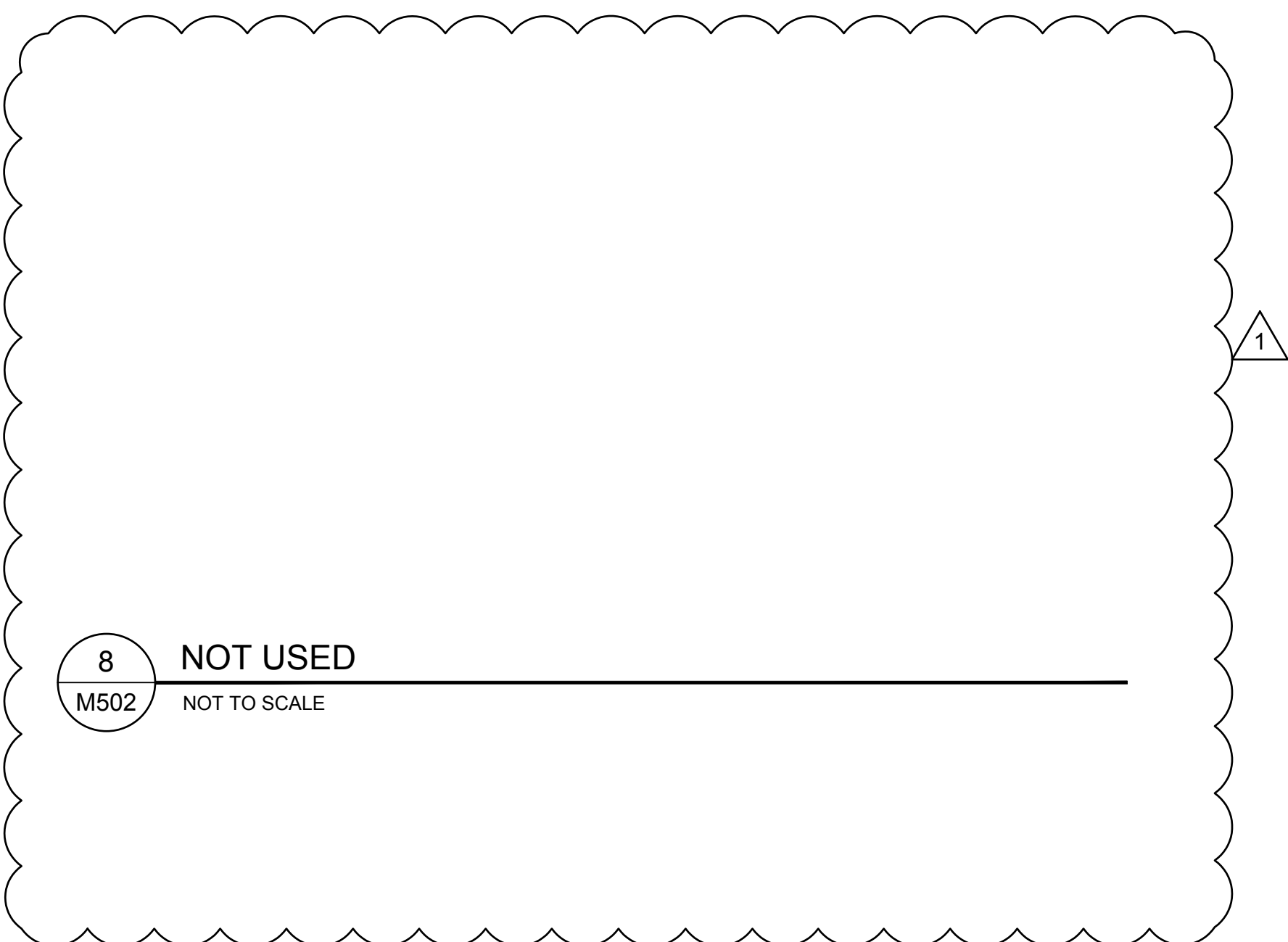
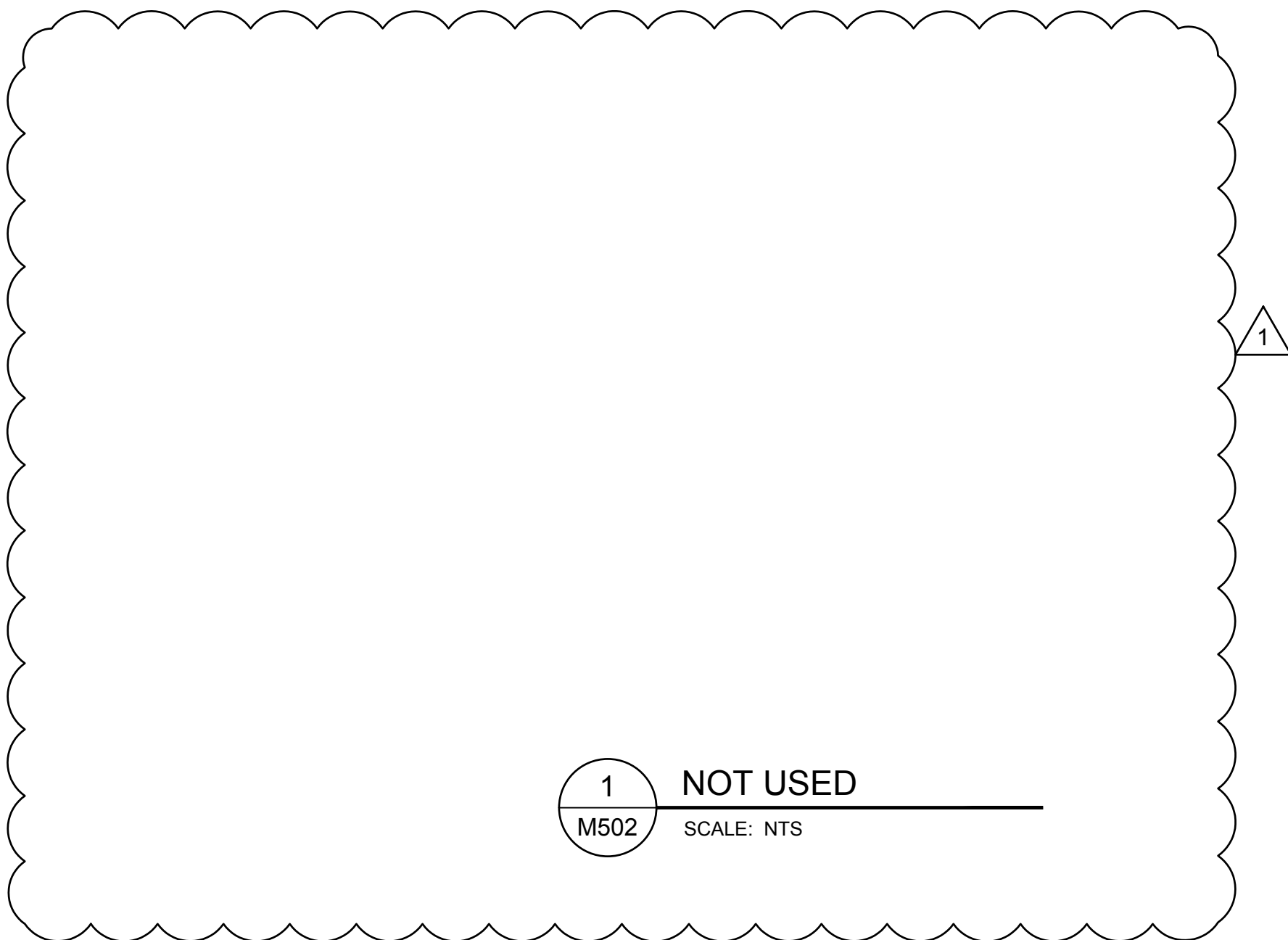
1 MECHANICAL EQUIPMENT YARD
M401 SCALE: 1/8" = 1'-0"



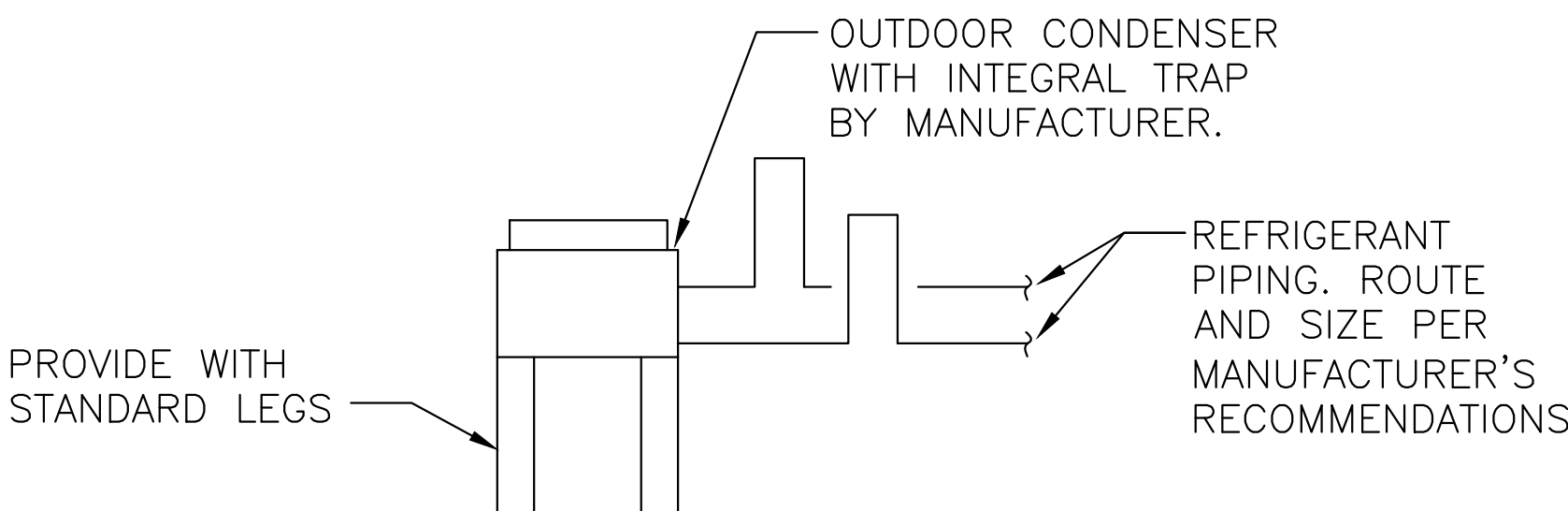
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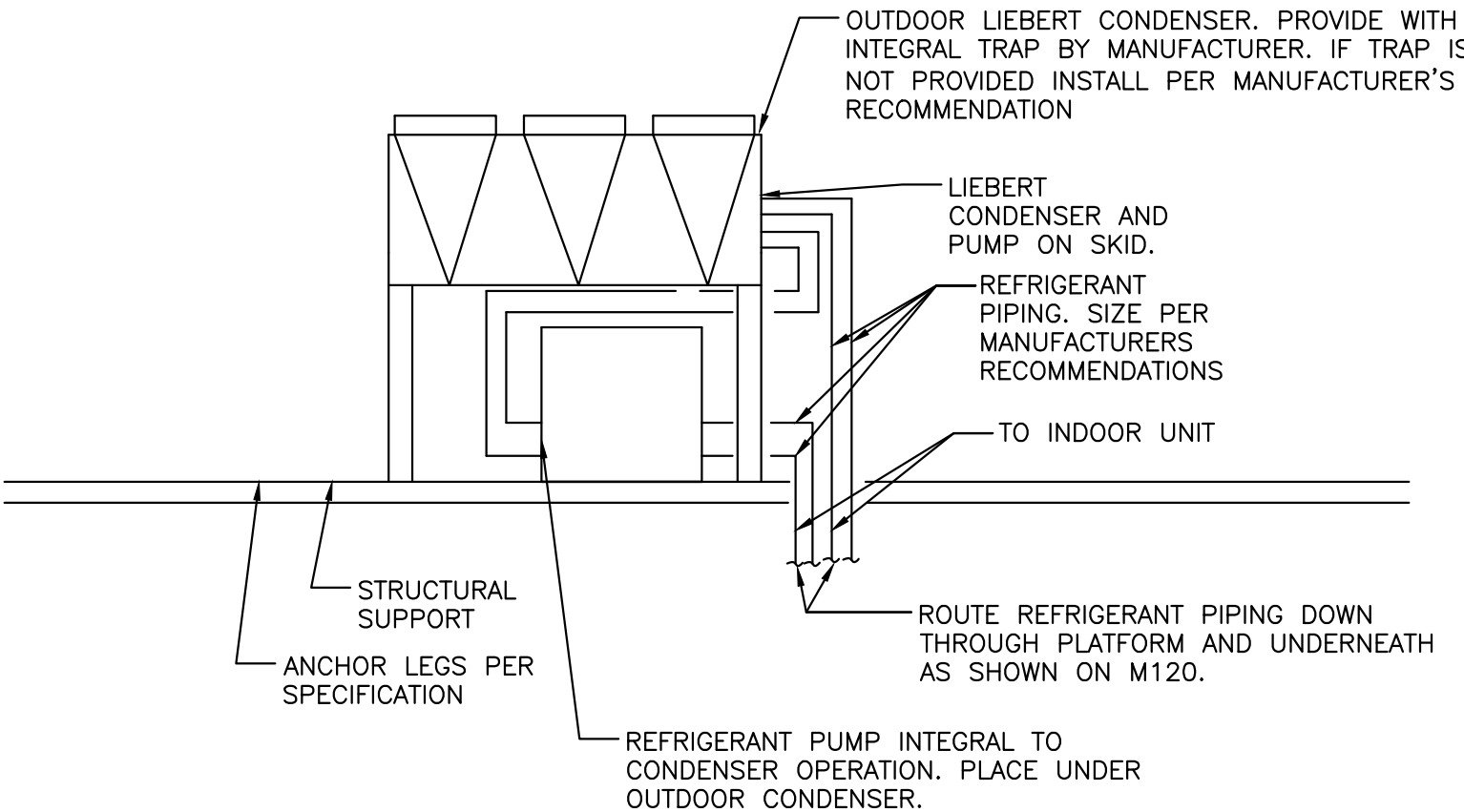
2 STEEL ANGLE CONTAINMENT DIKE
SCALE: NTS



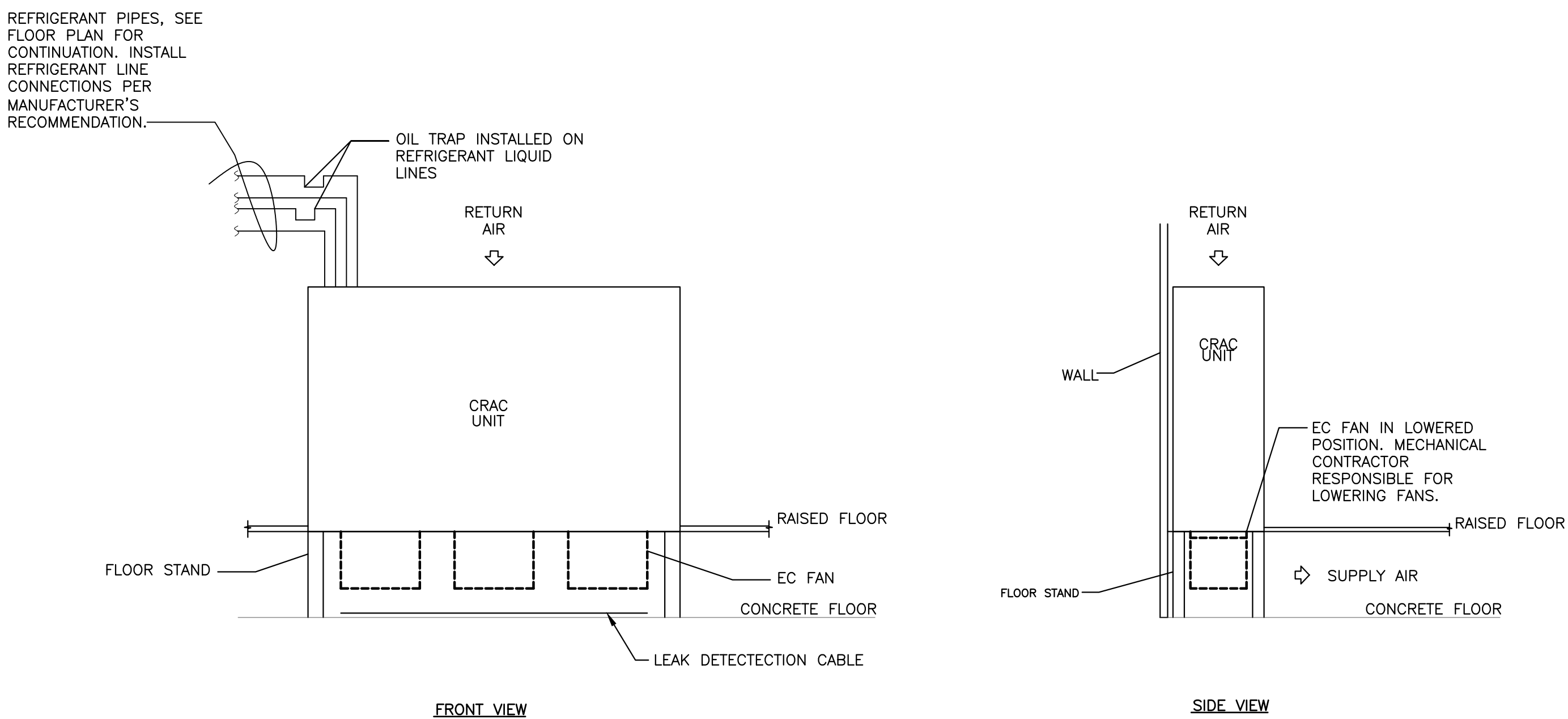
4 UPS ROOM DOWN-FLOW CRAC UNIT INSTALLATION
NOT TO SCALE



7 OUTDOOR CONDENSER DETAIL FOR 4 FAN CONDENSER ON GRADE
SCALE: NTS



6 OUTDOOR CONDENSER DETAIL FOR 4 FAN CONDENSER ON PLATFORM
SCALE: NTS



5 DATA HALL DOWN-FLOW CRAC UNIT INSTALLATION
SCALE: NTS

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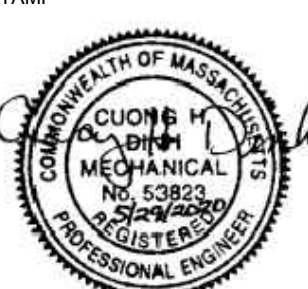
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WESTBOROUGH, MA 01581

REV	DESCRIPTION	DATE
1	BULLETIN No. 1	04.16.2020

NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR BIDS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

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DRAWN BY:	-	
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SHEET TITLE	MECHANICAL DETAILS
SHEET NUMBER	M502

1	2	3	4	5	6																											
COMPUTER ROOM AIR CONDITIONER SCHEDULE																																
TAG	CONDENSER (ACC)	CONFIG	DESIGN SETPOINTS		CAPACITY (KBH)	SUPPLY FANS				COMPRESSORS				ELECT COIL		HUMIDIFIER		FILTER		ELECTRIC				PIPE SIZE SCHEDULE		OPER WEIGHT LBS	DUAL DISCONNECT	COND PUMP	EC FANS	FLOOR STANDS	NOTES	BASIS OF DESIGN
			ROOM TEMP	DB/DP		TOTAL	SENS.	CFM (TOTAL)	QTY	MOTOR KW (TOTAL)	ESP (IN)	QTY	TYPE	TOTAL KW	STAGES	LB/HR	KW	SIZE	MERV	VOLTAGE/ PHASE	FLA	MCA	MOP	LIQUID	HOT GAS							
CRAC-115-1 (EXISTING)	ACC-115-1	DOWNFLOW	72/49.5	457	457	18,000	3	5.9	0.2	4	TANDEM DIGITAL SCROLL	--	--	--	2"	8	460/3	91.1	96.1	110	1-1/8	1-3/8	3565	X	X	X	24"	2,4,5,6,7,8,9	LIEBERT DA150			
CRAC-115-2 (EXISTING)	ACC-115-2	DOWNFLOW	72/49.5	457	457	18,000	3	5.9	0.2	4	TANDEM DIGITAL SCROLL	--	--	--	2"	8	460/3	91.1	96.1	110	1-1/8	1-3/8	3565	X	X	X	24"	2,4,5,6,7,8,9	LIEBERT DA150			
CRAC-115-3 (EXISTING)	ACC-115-3	DOWNFLOW	72/49.5	457	457	18,000	3	5.9	0.2	4	TANDEM DIGITAL SCROLL	--	--	--	2"	8	460/3	91.1	96.1	110	1-1/8	1-3/8	3565	X	X	X	24"	2,4,5,6,7,8,9	LIEBERT DA150			
CRAC-115-4 (EXISTING)	ACC-115-4	DOWNFLOW	72/49.5	457	457	18,000	3	5.9	0.2	4	TANDEM DIGITAL SCROLL	--	--	--	2"	8	460/3	91.1	96.1	110	1-1/8	1-3/8	3565	X	X	X	24"	2,4,5,6,7,8,9	LIEBERT DA150			
CRAC-115-5 (NEW)	ACC-115-5	DOWNFLOW	72/49.5	457	457	18,000	3	5.9	0.2	4	TANDEM DIGITAL SCROLL	--	--	--	2"	8	460/3	91.1	96.1	110	1-1/8	1-3/8	3565	X	X	X	24"	1,2,4,5,6,7,8,9	LIEBERT DA150			
CRAC-115-6 (NEW)	ACC-115-6	DOWNFLOW	72/49.5	457	457	18,000	3	5.9	0.2	4	TANDEM DIGITAL SCROLL	--	--	--	2"	8	460/3	91.1	96.1	110	1-1/8	1-3/8	3565	X	X	X	24"	1,2,4,5,6,7,8,9	LIEBERT DA150			
CRAC-115-7 (NEW)	ACC-115-7	DOWNFLOW	72/49.5	457	457	18,000	3	5.9	0.2	4	TANDEM DIGITAL SCROLL	--	--	--	2"	8	460/3	91.1	96.1	110	1-1/8	1-3/8	3565	X	X	X	24"	1,2,4,5,6,7,8,9	LIEBERT DA150			
CRAC-116 (EXISTING)	ACC-116	UPFLOW	85/65	106.1	103.1	4,500	1	2.4	0	1	DIGITAL SCROLL	--	--	--	2"	8	460/3	20.4	24.5	40	7/8	1-1/8	700	X	X	X	6"	2,4,7,8	LIEBERT PX029			
CRAC-117-1 (EXISTING)	ACC-117-1	DOWNFLOW	77/57	106.1	103.1	4,500	1	2.4	0	1	DIGITAL SCROLL	--	--	--	2"	8	460/3	20.4	24.5	40	7/8	1-1/8	700	X	X	X	6"	2,3,4,7,8	LIEBERT PX029			
CRAC-117-2 (EXISTING)	ACC-117-2	DOWNFLOW	77/57	106.1	103.1	4,500	1	2.4	0	1	DIGITAL SCROLL	--	--	--	2"	8	460/3	20.4	24.5	40	7/8	1-1/8	700	X	X	X	6"	2,3,4,7,8	LIEBERT PX029			
CRAC-117-3 (NEW)	ACC-117-3	DOWNFLOW	77/57	106.1	103.1	4,500	1	2.4	0	1	DIGITAL SCROLL	--	--	--	2"	8	460/3	20.4	24.5	40	7/8	1-1/8	700	X	X	X	6"	1,2,3,4,7,8	LIEBERT PX029			
CRAC-118 (EXISTING)	ACC-118	UPFLOW	85/65	106.1	103.1	4,500	1	2.4	0	1	DIGITAL SCROLL	--	--	--	2"	8	460/3	20.4	24.5	40	7/8	1-1/8	700	X	X	X	6"	2,4,7,8	LIEBERT PX029			
CRAC-119-1 (EXISTING)	ACC-119-1	DOWNFLOW	77/57	106.1	103.1	4,500	1	2.4	0	1	DIGITAL SCROLL	--	--	--	2"	8	460/3	20.4	24.5	40	7/8	1-1/8	700	X	X	X	6"	2,3,4,7,8	LIEBERT PX029			
CRAC-119-2 (EXISTING)	ACC-119-2	DOWNFLOW	77/57	106.1	103.1	4,500	1	2.4	0	1	DIGITAL SCROLL	--	--	--	2"	8	460/3	20.4	24.5	40	7/8	1-1/8	700	X	X	X	6"	2,3,4,7,8	LIEBERT PX029			
CRAC-119-3 (NEW)	ACC-119-3	DOWNFLOW	77/57	106.1	103.1	4,500	1	2.4	0	1	DIGITAL SCROLL	--	--	--	2"	8	460/3	20.4	24.5	40	7/8	1-1/8	700	X	X	X	6"	1,2,3,4,7,8	LIEBERT PX029			
NOTES:																																
1. NEW UNIT WITH CONDENSATE PUMP.																																
2. PROVIDE WITH ICOM CONTROLS LARGE DISPLAY.																																
3. PROVIDE WITH 36" PLENUM RETURN WITH FILTER ACCESS DOOR.																																
4. PROVIDE WITH WATER DETECTION KIT AND CABLE.																																
5. EC FANS SHALL BE ABLE TO BE LOWERED DOWN INTO THE RAISED FLOOR SUPPLY AIR PLENUM.																																
6. FANS TO OPERATE IN BACKDRAFT CAPABILITY.																																
7. PROVIDE WITH BOTH B460EXT CARDS AND LIEBERT UNITY CARD.																																
8. PROVIDE WITH SUPPLY AIR TEMPERATURE SENSOR, SPACE TEMPERATURE, SPACE HUMIDITY, & SUPPLY FAN START/STOP.																																
9. ASSOCIATED CONDENSER AND PUMP FOR CRAC UNIT TO BE POWERED THROUGH CRAC UNIT. SEE ELECTRICAL.																																

EXISTING OUTSIDE AIR UNIT SCHEDULE																											
TAG	SERVICE	CONFIG	DESIGN SETPOINTS TEMP/HUMID	SUPPLY AIR FAN DATA			TOTAL CAP MBH	COOLING			HEATING			FILTERS TYPE	ELECTRIC			SS DRAIN PAN	FILTER GAGE	INTERIOR X LIGHTS	SEISMIC RESTRAINTS	DISCONNECT X SWITCH	VFDs	EXTENDED GREASE FITTINGS	ECONOMIZER	NOTES	BASIS OF DESIGN
				CFM	ESP IN W/C	VOLT/PH		SENS CAP MBH	MIN STAGES	MIN EFF (EER)	KW	STAGES	FLA		MCA	MOP											
OUA-1	UPS ROOMS/EQUIPMENT ROOM	FRONT DISCHARGE	91/73	2,200	1	460/3	142.6	92.79	2	11.19	46	SCR	MERV 13	460/3	71.8	89.7	90		X			X				1	YORK/JCI JDMA-150
NOTES: 1. PROVIDE WITH T4" INSULATED ROOF CURB.																											

TAG	AREA SERVED	FAN FUNCTION	TYPE/ DRIVE	CFM	SP INCHES	FAN RPM	VOLTAGE/ PHASE	MOTOR HP	RPM	BASE TYPE	MAX SONES	OPER WEIGHT LBS	VIB ISO	DISCONN SWITCH	NOTES	BASIS OF DESIGN
HEF-117	UPS/BATTERY RM B	HYDROGEN EXH	DIRECT	150	0.750	1,647	115/1	1/4	1,725	SUSPENDED	12.4	62	X	X	1.5	GREENHECK SQ-97-VG
HEF-119	UPS/BATTERY RM A	HYDROGEN EXH	DIRECT	150	0.750	1,647	115/1	1/4	1,725	SUSPENDED	12.4	62	X	X	1.5	GREENHECK SQ-97-VG

NOTES:

1. FAN TO RUN CONTINUOUSLY.
2. FAN TO RUN CONTINUOUSLY DURING OCCUPIED HOURS' BUILDING OWNER TO PROVIDE OPERATION SCHEDULE.
3. FAN SHALL BE RATED FOR VFD OPERATION. CONTRACTOR TO PROVIDE VFD.
4. FAN SHALL BE UL RATED FOR OPERATION AT 300 DEGREES FOR 2 HOURS, 392 DEGREES FOR 2 HOURS, AND 572 DEGREES FOR 1 HR.
5. PROVIDE FAN SPEED CONTROLLER.
6. UNIT SHALL BE SHUT DOWN WHEN SMOKE IS DETECTED.

AIR COOLED CONDENSER SCHEDULE																				
TAG	LOCATION	SERVES	AMBIENT DESIGN TEMP (F)	NOM. CAPACITY (TONS)	FANS				REFRIGERANT				ELECTRICAL			WEIGHT (LB)	DISC SWITCH	OSHA FAN GUARD	NOTES	BASIS OF DESIGN
					NO.	HP EACH	LIQUID	HOT GAS	SUCTION	VOLTS/ PHASE	FLA	MCA	MOP							
ACC-115-1 (EXISTING)	PLATFORM	CRAC-115-1	100	42.5	4	3/4	1-1/8	1-3/8		460/3	18.2	19.1	20	1185	X	X		1.2	LIEBERT MCV330	
ACC-115-2 (EXISTING)	PLATFORM	CRAC-115-2	100	42.5	4	3/4	1-1/8	1-3/8		1185	X	X		X	X		1.2	LIEBERT MCV330		
ACC-115-3 (EXISTING)	PLATFORM	CRAC-115-3	100	42.5	4	3/4	1-1/8	1-3/8		460/3	18.2	19.1	20	1185	X	X	1.2	LIEBERT MCV330		
ACC-115-4 (EXISTING)	PLATFORM	CRAC-115-4	100	42.5	4	3/4	1-1/8	1-3/8		460/3	18.2	19.1	20	1185	X	X	1.2	LIEBERT MCV330		
ACC-115-5 (NEW)	PLATFORM	CRAC-115-5	100	42.5	4	3/4	1-1/8	1-3/8		460/3	18.2	19.1	20	1185	X	X	1.2.4	LIEBERT MCV330		
ACC-115-6 (NEW)	PLATFORM	CRAC-115-6	100	42.5	4	3/4	1-1/8	1-3/8		460/3	18.2	19.1	20	1185	X	X	1.2.4	LIEBERT MCV330		
ACC-115-7 (EXISTING)	PLATFORM	CRAC-115-7	100	42.5	4	3/4	1-1/8	1-3/8		460/3	18.2	19.1	20	1185	X	X	1.2.4	LIEBERT MCV330		
ACC-116 (EXISTING)	GRADE	CRAC-116	100	8.5	1	3/4	7/8	1-1/8		460/3	2.8	3.5	15	344	X	X	1	LIEBERT MCL055		
ACC-117-1 (EXISTING)	GRADE	CRAC-117-1	100	8.5	1	3/4	7/8	1-1/8		460/3	2.8	3.5	15	344	X	X	1	LIEBERT MCL055		
ACC-117-2 (EXISTING)	GRADE	CRAC-117-2	100	8.5	1	3/4	7/8	1-1/8		460/3	2.8	3.5	15	344	X	X	1	LIEBERT MCL055		
ACC-117-3 (NEW)	GRADE	CRAC-117-3	100	8.5	1	3/4	7/8	1-1/8		460/3	2.8	3.5	15	344	X	X	1.4	LIEBERT MCL055		
ACC-118 (EXISTING)	PLATFORM	CRAC-118	100	8.5	1	3/4	7/8	1-1/8		460/3	2.7	3.5	15	344	X	X	1	LIEBERT MCL055		
ACC-119-1 (EXISTING)	PLATFORM	CRAC-119-1	100	8.5	1	3/4	7/8	1-1/8		460/3	2.8	3.5	15	344	X	X	1	LIEBERT MCL055		
ACC-119-2 (EXISTING)	PLATFORM	CRAC-119-2	100	8.5	1	3/4	7/8	1-1/8		460/3	2.8	3.5	15	344	X	X	1	LIEBERT MCL055		
ACC-119-3 (NEW)	PLATFORM	CRAC-119-3	100	8.5	1	3/4	7/8	1-1/8		460/3	2.8	3.5	15	344	X	X	1.4	LIEBERT MCL055		
NOTES:																				
1. PROVIDE WITH LOW AMBIENT KIT																				
2. PROVIDE WITH PUMP AND CONDENSER ON LIEBERT PACKAGED SKID WITH ONE REFRIGERANT CONNECTION AND ONE ELECTRICAL CONNECTION. PUMP WEIGHT 390 LBS.																				
3. NOT USED.																				
4. NEW UNIT																				

EXISTING DIFFUSER, REGISTER AND REGISTER SCHEDULE										
TAG	DESCRIPTION	STYLE	MATERIAL	CONNECTION	CEILING WALL TYPE NONE	DUCT CONNECTION TYPE EXPOSED	NC CRITERIA MAX NC-30	OBD	BASIS OF DESIGN	NOTES
S-1	DUCT MOUNTED SUPPLY AIR GRILLE	DOUBLE DEFLECTION	STEEL	RECTANGULAR				X	TITUS 300RS	1
R-1	RETURN AIR GRILLE	SINGLE DEFLECTION	STEEL	RECTANGULAR			NC-30		TITUS 350ZRL	1,2
E-1	EXHAUST AIR GRILLE	SINGLE DEFLECTION	STEEL	RECTANGULAR			NC-30		TITUS 350ZRL	1,2,8
NOTES:	1. GRILLE WITH 3/4" BLADE SPACING. 2. GRILLE WITH 35 DEGREE FIXED DEFLECTION. 3. 1/4" HARDWARE CLOTH SECURED TO DUCT WITH ALL EDGES HEMMED. 4. ACT = ACOUSTICAL CEILING TILE. 5. GYP = GYPSUM WALL BOARD. 6. PROVIDE COLLAR WITH NECK SIZE AS SHOWN ON DRAWINGS. 7. PROVIDE WITH 1-1/2" BLADES. 8. PROVIDE WITH OPPOSED BLADE DAMPER									

EXISTING ELECTRIC UNIT HEATER (EUH) SCHEDULE									
TAG	LOCATION	CAPACITY KW	STAGES	VOLT/PH	AIRFLOW CFM	DISCHARGE	WALL BRACKET	INTEGRAL T'STAT	BASIS OF DESIGN
EUH-104	CORRIDOR 104	5	1	480/3	350	HORIZONTAL	X	X	QMARK MUH05-41
EUH-121	CORRIDOR 121	5	1	480/3	350	HORIZONTAL	X	X	QMARK MUH05-41
EUH-125	CORRIDOR 125	5	1	480/3	350	HORIZONTAL	X	X	QMARK MUH05-41

NOTES:

EXISTING LOUVER SCHEDULE						
TAG	MANUFACTURER	MODEL	SERVICE	MATERIAL	WIDTH x HEIGHT	REMARKS
L-2	RUSKIN	ELF6375DXD	HEF-119	ALUMINUM	24 X 12	1, 2, 3, 4
L-4	RUSKIN	ELF6375DXD	HEF-119	ALUMINUM	24 X 12	1, 2, 3, 4

NOTES:

1. LOUVER SELECTION IS BASED ON RUSKIN. EQUIVALENT MANUFACTURERS: AS SPECIFIED. SEE ARCH. DRAWINGS FOR EXACT LOCATIONS.
2. EXTRUDED ALUMINUM LOUVER WITH STATIONARY LOUVER WITH MINIMUM OF 6" DEEP. PROVIDE ALUMINUM BIODSCREEN IN THE REMOVABLE FRAME.
3. LOUVER TO BE RATED FOR MIAMI-DADE COUNTY WIND LOADING.
4. PROVIDE FRAME FRAME.
5. PROVIDE BOX (NON-FLANGE) TYPE FRAME.

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SHEET TITLE	
MECHANICAL SCHEDULES	
SHEET NUMBER	M601

EXISTING MAKE-UP AIR UNIT (MAU) SCHEDULE																																										
SYMBOL	SERVICE	CONFIG	DESIGN SETPOINTS TEMP/HUMID	SUPPLY AIR FAN DATA						DX COOLING COIL				PRE-FILTERS			HIGH EFFICIENCY FILTERS			ELECTRIC COIL			ELECTRIC			CABINET SIZE (IN)			SS DRAIN PAN	FILTER GAGE	INTERIOR LIGHTS	SEISMIC RESTRAINTS	DISCONNECT SWITCH	VFD'S	EXTENDED GREASE FITTINGS	ECONOMIZER	OP WT LBS	BASIS OF DESIGN				
				CFM	MIN OSA CFM	FAN TYPE	ESP IN WC	RPM MAX	MOTOR DATA		TOTAL CAP MBH	SENS CAP MBH	EAT (DEG.F)	LAT (DEG.F)	TYPE	SIZE	QTY	TYPE	SIZE	QTY	KW	VOLTAGE/ PHASE	# OF STAGES	VOLTAGE/ PHASE	FLA	MCA	MOP	OUTSIDE														
									HP	VOLTAGE/ PHASE																		W											H	L		
MAU-1	SMOKE PURGE AND PRESSURE CONTROL	HORIZ	55F/40%	12,000	2,200	PLENUM	2.0	1,458	20.0	460/3	775.0	507.0	91.0	72.0	30%	PLEATED	12" x 24" 24" x 24"	4 8	85%	PLEATED	12" x 24" 24" x 24"	4 8	238.0	460/3/60	13	460/3/60	428.0	509.0	700	8'-4"	6'-0"	27'-10"	X	X	X	X	X				10,038	MAMMOTH - CDBHEFR-654B-E1061-5B-MUA
NOTES: 1: COMPLETE WITH MOTORIZED INLET DAMPER, PREMIUM EFFICIENCY MOTOR, FILTER SECTION, SMOKE DETECTOR, FUSED DISCONNECT, SA THERMOSTAT, R410a REFRIGERANT, CONTROLS PACKAGE AND INTERLOCKED WITH FIRE SUPPRESSION SYSTEM																																										

REMOVED PER PREVIOUS PROJECT

EXISTING COMPUTER ROOM AIR CONDITIONERS (CRAC) SCHEDULE - GLYCOL (PURCHASED BY VERIZON AND INSTALLED BY G.C.)																																								
SYMBOL	CONFIG	DESIGN SETPOINTS	CAPACITY MBH			AIR SIDE				WATER SIDE				ELECT COIL (REHEAT)		HUMIDIFIER		ELECTRIC						FILTERS				MIN EER	IPLV	OPER WEIGHT LBS	RAISED FLOOR STAND	DISCONNECT	LOCKOUT RELAYS	LEAK DET	COND PUMP	3-WAY VALVE	BASIS OF DESIGN			
						CFM	MOTOR HP	MIN ESP INCHES	TSP (IN)	GPM	EWT DEG F	LWT DEG F	MAX PD FEET	ECONOMIZER CAPACITY (MBH TOTAL)	TOTAL KW	STAGES	LB/HR	KW	VOLTAGE/ PHASE	FLA	WSA	MOP	PRE	FINAL	MIN PRESS DROP (IN WC)	MAX PRESS DROP (IN WC)														
		TEMP/HUMID	NOM. TONS	SENS.	TOTAL																																			
CRAC-1A	REAR UPFLOW	72F/45RH	30.0	257.3	257.3	14,500	15.0	0.2	3	90.0	43.3	53.5	79.5	294.0	30.0	3	22.0	9.6	460/3/60	95.4	109.1	125	35%	65%									2,750	X	X	X	X	X	X	LIEBERT – VS-10SKUADEI
CRAC-1B	REAR UPFLOW	72F/45RH	30.0	257.3	257.3	14,500	15.0	0.2	3	90.0	43.3	53.5	79.5	294.0	30.0	3	22.0	9.6	460/3/60	95.4	109.1	125	35%	65%									2,750	X	X	X	X	X	X	LIEBERT – VS-10SKUADEI
CT-CRAC-2	REAR UPFLOW	72F/45RH	30.0	257.3	257.3	14,500	15.0	0.2	3	90.0	43.3	53.5	79.5	294.0	30.0	3	22.0	9.6	460/3/60	95.4	109.1	125	35%	65%									2,750	X	X	X	X	X	X	LIEBERT – VS-10SKUADEI
NOTES:																																								
1. PROVIDE UNITS WITH CONDENSATE PUMP WITH DUAL FLOAT FOR REMOTE ALARM.										4. PROVIDE DRAIN PAN BELOW UNIT										7. 6" HIGH FLOOR STAND																				
2. PROVIDE INFRARED HUMIDIFIER WITH ADJUSTABLE CONTROLS.										5. PROVIDE UNITS WITH FREE COOLING COILS.																														
3. UNITS SHALL BE PROVIDED WITH DUAL GLYCOL PUMP AND EXPANSION TANK PACKAGE.										6. STARTER AND FUSED DISCONNECT																														

EXISTING COMPUTER ROOM AIR CONDITIONERS (CRAC) SCHEDULE - DX (PURCHASED BY VERIZON AND INSTALLED BY G.C.)																																			
SYMBOL	CONFIG	DESIGN SETPOINTS	CAPACITY MBH			AIR SIDE				COMPRESSORS		ELECT COIL (REHEAT)		HUMIDIFIER		ELECTRIC						FILTERS				MIN EER	IPLV	OPER WEIGHT LBS	RAISED FLOOR STAND	DISCONNECT	LOCKOUT RELAYS	LEAK DET	COND PUMP	3-WAY VALVE	BASIS OF DESIGN
		TEMP/HUMID	NOM. TONS	SENS.	TOTAL	CFM	MOTOR HP	MIN ESP INCHES	TSP (IN)	QTY	TYPE	TOTAL KW	STAGES	LB/HR	KW	VOLTAGE/ PHASE	FLA	WSA	MOP	PRE	FINAL	MIN PRESS DROP (IN WC)	MAX PRESS DROP (IN WC)												
CRAC-3A	REAR UPFLOW	72F/45%RH	5.0	54.7	54.7	2,800	2.0	0.3	1.0	1	SCROLL	15.0	2	11.0	3.9	460/3/60	33.1	40.5	45.0	35%	65%				750		X	X	X	X	LIEBERT -- BU067ADA0EI				
CRAC-3B	REAR UPFLOW	72F/45%RH	5.0	54.7	54.7	2,800	2.0	0.3	1.0	1	SCROLL	15.0	2	11.0	3.9	460/3/60	33.1	40.5	45.0	35%	65%				750		X	X	X	X	LIEBERT -- BU067ADA0EI				
CRAC-4A	REAR UPFLOW	72F/45%RH	20.0	189.3	203.8	10,200	7.5	0.3	1.0	2	SCROLL	25.0	3	22.0	7.8	460/3/60	62.9	75.9	80.0	35%	65%				2,070	X	X	X	X	X	LIEBERT -- VS070ADA0EI				
CRAC-4B	REAR UPFLOW	72F/45%RH	20.0	189.3	203.8	10,200	7.5	0.3	1.0	2	SCROLL	25.0	3	22.0	7.8	460/3/60	62.9	75.9	80.0	35%	65%				2,070	X	X	X	X	X	LIEBERT -- VS070ADA0EI				
NOTES:																																			
1. PROVIDE UNITS WITH CONDENSATE PUMP WITH DUAL FLOAT FOR REMOTE ALARM.										4. PROVIDE DRAIN PAN BELOW UNIT.																									
2. PROVIDE INFRARED HUMIDIFIER WITH ADJUSTABLE CONTROLS.										5. UNITS TO BE R407c REFRIGERANT																									
3. STARTER AND FUSED DISCONNECT																																			

EXISTING GLYCOL PUMP (GP) SCHEDULE (PURCHASED BY VERIZON AND INSTALLED BY G .C.)													
SYMBOL	SYSTEM SERVED	TYPE	GPM	TOTAL HEAD FEET	EFF %	DESIGN PRESS PSIG	NPSHR FEET	MOTOR				BASIS OF DESIGN	NOTES
								BHP	HP	MAX RPM	VOLTAGE		
GP-1A	CRAC-1A	IN-LINE	90.0	145.0	70	125.0	8	7.5	7.5	3,500	480/3/60	LIEBERT 9A31258G2	SEE NOTES
GP-1B	CRAC-1B	IN-LINE	90.0	145.0	70	125.0	8	7.5	7.5	3,500	480/3/60	LIEBERT 9A31258G2	SEE NOTES
GP-2	CRAC-2	IN-LINE	90.0	145.0	70	125.0	8	7.5	7.5	3,500	480/3/60	LIEBERT 9A31258G2	SEE NOTES
NOTES:													
1. DRYCOOL AND PUMP TO BE POWERED FROM THE SAME 3 PHASE FEEDER 2. DUAL PACKAGED GYLCOL PACKAGED PUMP KITS SUPPLIED WITH CRAC UNITS.													
3. SUPPLIED AND INSTALLED IN WEATHERPROOF ENCLOSURE COMPLETE WITH WEATHERPROOF STARTER AND FUSED DISCONNECT													

EXISTING AIR COOLED CONDENSER (ACCU) SCHEDULE (PURCHASED BY VERIZON AND INSTALLED BY G.C.)																								
SYMBOL	LOCATION	SERVES	AMBIENT DESIGN TEMP (F)	TOTAL HEAT REJECTION (MBH)	NOM. CAPACITY (TONS)	FANS			PIPE CONNECTIONS			ELECTRICAL				UNIT WEIGHT (LBS)	MOTOR STARTER	DISC SWITCH	OSHA FAN GUARD	LEE-TEMP RECEIVER	FAN SPEED CONTROL	HALL GUARD	BASIS OF DESIGN	NOTES
						NO.	HP EACH	CFM	NO. OF CIRCUITS	LIQUID	SUCTION	TYPE	VOLTS/ PHASE	FLA	WSA									
ACCU-3A	GRADE	CRAC-3A	91.0	56.4	5.0	1	0.5	6,650	1	1/2"	1-1/8"	R407c	460/3	1.8	2.3	15.0	351	X	X		X	X	LIEBERT - TCSV104Z	SEE NOTES
ACCU-3B	GRADE	CRAC-3B	91.0	56.4	5.0	1	0.5	6,650	1	1/2"	1-1/8"	R407c	406/3	1.8	2.3	15.0	351	X	X		X	X	LIEBERT - TCSV104Z	SEE NOTES
ACCU-4A	GRADE	CRAC-4A	91.0	210.0	20.0	3	0.5	6,650	2	1-1/8"	1-3/8"	R407c	406/3	5.2	5.7	25.0	670	X	X		X	X	LIEBERT - TCDV308	SEE NOTES
ACCU-4B	GRADE	CRAC-4A	91.0	210.0	20.0	3	0.5	6,650	2	1-1/8"	1-3/8"	R407c	406/3	5.2	5.7	25.0	670	X	X			X	LIEBERT - TCDV308	SEE NOTES
NOTES:																								
1. SUPPLIED AND INSTALLED COMPLETE WITH WEATHERPROOF STARTER AND FUSED DISCONNECT																								

EXISTING HUMIDIFIER (H) SCHEDULE																	
SYMBOL	CAPACITY LBS/HR	DESCRIPTION	ENTERING AIR CONDITIONS			LEAVING AIR CONDITIONS			ELECTRICAL				BASIS OF DESIGN	DISPERSION ELEMENT			
			DB F DEG	RH %	SPECIFIC HUMIDITY GRAINS/ LB DRY AIR	DB F DEG	RH %	SPECIFIC HUMIDITY GRAINS/ LB DRY AIR	KW	STAGES	AMPS	VOLTAGE		FACE DIMENSIONS	OVERALL DIMENSIONS	HEADER CONNECTION	BASIS OF DESIGN
CT-1-1A	213.6	ELECTRIC TO STEAM HUMIDIFIER	52.5	7.0	4.0	55.0	55	48.0	75.0	6	90.2	460/3/60	DRISTEEM - VLG-75-3	96"x22"	96"x22"	4"	DRISTEEM - ULTRA-SORB LV
CT-1-1B	213.6	ELECTRIC TO STEAM HUMIDIFIER	52.5	7.0	4.0	55.0	55	48.0	75.0	6	90.2	460/3/60	DRISTEEM - VLG-75-3	96"x22"	96"x22"	4"	DRISTEEM - ULTRA-SORB LV
NOTES:																	
1. INSTALLED IN OUTDOOR WEATHER ENCLOSURE COMPLETE WITH ELECTRIC HEATER																	
2. SUPPLIED AND INSTALLED COMPLETE WITH AIRFLOW PROVING SWITCH, HUMIDISTAT, CONTROLS AND INSULATED TUBES.																	

1. ALL EQUIPMENT LISTED ON SHEET M602 IS EXISTING AND FOR REFERENCE ONLY.

EXISTING DRYCOOLER UNIT (DC) SCHEDULE (PURCHASED BY VERIZON AND INSTALLED BY G.C.)																										
SYMBOL	LOCATION	SERVES	AMBIENT DESIGN TEMP (F)	TOTAL HEAT REJECTION (MBH)	NOM. CAP. (TONS)	FANS			PIPE CONNECTIONS			ELECTRICAL				EER	IPLV	UNIT WEIGHT (LBS)	MOTOR STARTER	DISC SWITCH	OSHA FAN GUARD	LEE-TEMP RECEIVER	FAN CYCLE CONTROL	FAN GUARD	BASIS OF DESIGN	NOTES
						NO.	HP EACH	CFM	NO. OF CIRCUITS	SUPPLY	RETURN	TYPE	VOLTS/ PHASE	FLA	WSA											
DC-1A	ROOF	CRAC-1A	95.0	324.4	30.0	4	0.75	4,500	1	2-1/2"	2-1/2"	GLYCOL	460/3	17.8	20.6	30.0		1,250	X	X			X	X	LIEBERT DD-466	SEE NOTES
DC-1B	ROOF	CRAC-1B	95.0	324.4	30.0	4	0.75	4,500	1	2-1/2"	2-1/2"	GLYCOL	460/3	17.8	20.6	30.0		1,250	X	X			X	X	LIEBERT DD-466	SEE NOTES
CT DC-2	GRADE	CRAC-2	95.0	324.4	30.0	4	0.75	4,500	1	2-1/2"	2-1/2"	GLYCOL	460/3	17.8	20.6	30.0		1,250	X	X			X	X	LIEBERT DD-466	SEE NOTES
NOTES: 1. SUPPLIED AND INSTALLED COMPLETE WITH WEATHERPROOF STARTER AND FUSED DISCONNECT 2. DRYCOOLER AND PUMP TO BE POWERED FROM THE SAME 3 PHASE FEEDER																										

SYMBOL	AREA SERVED	FAN FUNCTION	TYPE/DRIVE	CFM	SP INCHES	FAN RPM	MOTOR				BASE TYPE	MAX. SONES WATTS	OPER WEIGHT LBS	VIBRATION ISOLATORS	DISCONNECT SWITCH	BASIS OF DESIGN
							VOLTAGE/ PHASE	BHP	HP	RPM						
SEF-1	SWITCH/RECT/BATT/DACS	SMOKE PURGE	UPBLAST – BELT	8,800/10,000	1.0	1,973	460/3/60	–	5.0	1,725	CURB		350		X	GREENHECK – TBI-FS-4L24-50
SEF-2	WSB02 RECTIFIER	SMOKE PURGE	UPBLAST – DIRECT	1,500	0.25	1,770	460/3/60	–	0.5	1,770	CURB		70		X	GREENHECK – AX-36-160-0628
SEF-3	VENDOR TELCO	SMOKE PURGE	UPBLAST – DIRECT	1,400	0.25	3,770	460/3/60	–	0.5	1,770	CURB		70		X	GREENHECK – AX-36-160-0628

NOTES:

1. SUPPLIED & INSTALLED COMPLETE WITH STARTER AND DISCONNECT

2. SEF-1 TO BE PROVIDED WITH VFD SET TO CONTROL TO 8000/10,000 CFM

EXISTING EXHAUST FAN (EF) SCHEDULE																
SYMBOL	AREA SERVED	FAN FUNCTION	TYPE/DRIVE	CFM	SP INCHES	FAN RPM	MOTOR				BASE TYPE	MAX SONES WATTS	OPER WEIGHT LBS	VIBRATION ISOLATORS	DISCONNECT SWITCH	BASIS OF DESIGN
							VOLTAGE/ PHASE	BHP	HP	RPM						
EF-1	RECTIFIER/BATTERY ROOM	BATTERY VENTILATION	INLINE - DIRECT	700	0.25	1,550	120/1/60	-	1/8	1,550	-		41	X	X	GREENHECK - SQ-95-D
NOTES: 1: SUPPLIED & INSTALLED COMPLETE WITH STARTER AND DISCONNECT																

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SHEET TITLE

EXISTING
MECHANICAL
SCHEDULES

SHEET NUMBER

M602

1

2

3

4

5

6

EXISTING EXHAUST AND MAKE UP AIR SYSTEM MOTORIZED DAMPER SCHEDULE																						
SYMBOL	LOCATION	TYPE	DESCRIPTION	POSITION/STATUS																	BASIS OF DESIGN	
				ACTUATOR		NORMAL OPERATION POSITION	ZONE 1 WSB01 SWITCH		ZONE 2 WSB01 DACS/TELCO		ZONE 3 WSB01 BATTERY/RECT		ZONE 4 WSB02 RECTIFIER		ZONE 5 WSB02 ACP		ZONE 6 VENDOR TELCO		ZONE 7 WSB02 BATTERY			
				VOLTAGE	FAIL POSITION		FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN		
MD-1	ZONE 1	OPPOSED BLADE	WSB01 SWITCH MAKE UP	120v	OPEN	M	---	OP	CL	CL	---	---	---	---	---	---	---	---	---	---	RUSKIN CD-60	
MD-2	ZONE 2	OPPOSED BLADE	WSB01 DACS/TELCO MAKE UP	120v	OPEN	M	---	---	---	OP	---	---	---	---	---	---	---	---	---	---	RUSKIN CD-60	
MD-3A	ZONE 3	OPPOSED BLADE	WSB01 BATT/RECT MAKE UP	120v	OPEN	M	CL	CL	CL	CL	---	OP	---	---	---	---	---	---	---	---	RUSKIN CD-60	
MD-3B	ZONE 3	OPPOSED BLADE	WSB01 BATT/RECT EXHAUST	120v	OPEN	CL	---	---	---	---	---	OP	---	---	---	---	---	---	---	---	RUSKIN CD-60	
MD-3C	ZONE 3	OPPOSED BLADE	WSB01 BATT/RECT EXHAUST	120v	OPEN	CL	---	---	---	---	---	OP	---	---	---	---	---	---	---	---	RUSKIN CD-60	
MD-4	ZONE 4	OPPOSED BLADE	WSB02 RECTIFIER MAKE UP	120v	OPEN	M	---	---	---	---	---	---	OP	---	---	---	---	---	---	---	RUSKIN CD-60	
MD-5	ZONE 5	OPPOSED BLADE	WSB02 ACP MAKE UP	120v	OPEN	M	---	---	---	---	---	---	---	---	OP	---	---	---	---	---	RUSKIN CD-60	
MD-6	ZONE 6	OPPOSED BLADE	VENDOR TELCO MAKE UP	120v	OPEN	M	---	---	---	---	---	---	---	---	---	---	OP	---	---	---	RUSKIN CD-60	
MD-7	ZONE 7	OPPOSED BLADE	WSB02 BATTERY ROOM	--	--	OP/CL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	EXISTING DAMPER	
MD-8	ZONE 7	OPPOSED BLADE	WSB02 BATTERY ROOM	--	--	OP/CL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	EXISTING DAMPER	
MD-9	ZONE 7	OPPOSED BLADE	WSB02 BATTERY ROOM	--	--	CL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	OP EXISTING DAMPER	
MD-10	ZONE 7	OPPOSED BLADE	WSB02 BATTERY ROOM	--	--	CL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	OP EXISTING DAMPER	
NOTES: 1. SEE FM-200 ZONE MAP 2. CL=CLOSED, M=MODULATES, OP=OPEN 3. (---) DOUBLE DASH = USE NORMAL OPERATION POSITION 4. SEE MECHANICAL DRAWINGS FOR DAMPER SIZES AND LOCATIONS 5. EXISTING DAMPERS TO BE CONTROLLED BY NEW DDC SYSTEM 6. NEW DAMPERS TO BE PROVIDED WITH END SWITCHES, EXISTING DAMPERS TO BE FITTED WITH NEW END SWITCHES																						

EXISTING FIRE/SMOKE DAMPER SCHEDULE																					
SYMBOL	LOCATION	TYPE	DESCRIPTION	NORMAL OPERATION/FAIL POSITION	POSITION/STATUS															BASIS OF DESIGN	
					ZONE 1 WSB01 SWITCH		ZONE 2 WSB01 DACS/TELCO		ZONE 3 WSB01 BATTERY/RECT		ZONE 4 WSB02 RECTIFIER		ZONE 5 WSB02 ACP		ZONE 6 VENDOR TELCO		ZONE 7 WSB02 BATTERY				
					FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN	FM200 DISCHARGE	PURGE FAN			
FSD-1A	ZONE 1&2	FIRE/SMOKE DAMPER	WSB01 SWITCH MAKE UP	OPEN	CL	---	CL	---	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	RUSKIN FSD-60	
FSD-1B	ZONE 1	FIRE/SMOKE DAMPER	WSB01 SWITCH EXHAUST	CLOSED	---	OP	---	---	---	---	---	---	---	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-1C	ZONE 1	FIRE/SMOKE DAMPER	WSB01 SWITCH EXHAUST	CLOSED	---	OP	---	---	---	---	---	---	---	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-2A	ZONE 2	FIRE/SMOKE DAMPER	WSB01 DACS/TELCO MAKE UP	OPEN	CL	CL	CL	---	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	RUSKIN FSD-60	
FSD-2B	ZONE 2	FIRE/SMOKE DAMPER	WSB01 DACS/TELCO EXHAUST	CLOSED	---	---	---	OP	---	---	---	---	---	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-2C	ZONE 1&2	FIRE/SMOKE DAMPER	WSB01 SWITCH/TELCO EXHAUST	CLOSED	---	OP	---	OP	---	---	---	---	---	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-3	ZONE 1-3	FIRE/SMOKE DAMPER	WSB01 BATT/RECT MAKE UP	OPEN	CL	---	CL	---	CL	---	CL	CL	CL	CL	CL	CL	CL	CL	CL	RUSKIN FSD-60	
FSD-4A	ZONE 4	FIRE/SMOKE DAMPER	WSB02 RECTIFIER EXHAUST	CLOSED	---	---	---	---	---	---	---	OP	---	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-4B	ZONE 4	FIRE/SMOKE DAMPER	WSB02 RECTIFIER EXHAUST	CLOSED	---	---	---	---	---	---	---	OP	---	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-5A	ZONE 5	FIRE/SMOKE DAMPER	WSB02 ACP MAKE UP	OPEN	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	---	CL	CL	CL	CL	RUSKIN FSD-60	
FSD-5B	ZONE 5	FIRE/SMOKE DAMPER	WSB02 ACP EXHAUST	CLOSED	---	---	---	---	---	---	---	---	OP	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-5C	ZONE 5	FIRE/SMOKE DAMPER	WSB02 ACP EXHAUST	CLOSED	---	---	---	---	---	---	---	---	OP	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-6A	ZONE 6	FIRE/SMOKE DAMPER	VENDOR TELCO MAKE UP	OPEN	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	---	CL	CL	CL	RUSKIN FSD-60	
FSD-6B	ZONE 6	FIRE/SMOKE DAMPER	VENDOR TELCO EXHAUST	CLOSED	---	---	---	---	---	---	---	---	---	---	---	OP	---	---	---	---	RUSKIN FSD-60
FSD-7	ZONE 1&2	FIRE/SMOKE DAMPER	WSB01 SWITCH/TELCO EXHAUST	CLOSED	---	OP	---	OP	---	---	---	---	---	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-8	ZONE 1&2	FIRE/SMOKE DAMPER	SMOKE PURGE MAIN DUCT	CLOSED	---	OP	---	OP	---	OP	---	---	---	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-9	ZONE 3	FIRE/SMOKE DAMPER	BATTERY VENT MAIN DUCT	OPEN	---	---	---	---	---	CL	CL	---	---	---	---	---	---	---	---	---	RUSKIN FSD-60
FSD-10	ZONE 1-4	FIRE/SMOKE DAMPER	MAKE-UP AIR MAIN DUCT	OPEN	CL	---	CL	---	CL	---	CL	---	CL	CL	CL	CL	CL	---	---	---	RUSKIN FSD-60
FSD-11	ZONE 1-4	FIRE/SMOKE DAMPER	MAKE-UP AIR MAIN DUCT	OPEN	CL	---	CL	---	CL	---	CL	---	CL	---	CL	CL	CL	---	---	---	RUSKIN FSD-60
FSD-12	ZONE 1-3	FIRE/SMOKE DAMPER	MAKE-UP AIR MAIN DUCT	OPEN	CL	---	CL	---	CL	---	CL	CL	CL	CL	CL	CL	---	---	---	---	RUSKIN FSD-60
FSD-13	ZONE 7	FIRE/SMOKE DAMPER	RETURN AIR TO ERV-1	OPEN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	CL	CL	EXISTING DAMPER
FSD-14	ZONE 7	FIRE/SMOKE DAMPER	SUPPLY AIR FROM ERV-1	OPEN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	CL	CL	EXISTING DAMPER
FSD-15	ZONE 7	FIRE/SMOKE DAMPER	RETURN AIR TO ERV-2	OPEN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	CL	CL	EXISTING DAMPER
FSD-16	ZONE 7	FIRE/SMOKE DAMPER	SUPPLY AIR FROM ERV-2	OPEN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	CL	CL	EXISTING DAMPER
NOTES: 1. SEE FM-200 ZONE MAP 2. CL=CLOSED, OP=OPEN 3. (---) DOUBLE DASH = USE NORMAL OPERATION POSITION 4. SEE MECHANICAL DRAWINGS FOR DAMPER SIZES AND LOCATIONS. 5. FIRE/SMOKE DAMPERS TO BE 2-POSITION. 6. PROVIDE OPEN AND CLOSED POSITION SWITCHES AS PART OF ELECTRONIC FUSIBLE LINK ASSEMBLY. 7. ACTUATORS TO BE 120 VAC FROM BUILDING POWER. 8. REFER TO DETAL ON M601 FOR INSTALLATION DETAIL. 9. EXISTING DAMPERS TO BE CONTROLLED BY NEW DDC SYSTEM. INSTALL ALL NECESSARY END SWITCHES REQUIRED FOR OPERATION.																					

EXISTING SUPPLY AIR GRILLE AND DIFFUSER SCHEDULE														
SYMBOL	LOCATION	DESCRIPTION	STYLE	MATERIAL	NECK SIZE INCHES	NOMINAL FACE SIZE INCHES	AIRFLOW MIN-MAX CFM	CEILING WALL TYPE	DUCT CONNECTION TYPE	NC CRITERIA	OBD	CONCEALED FASTENERS	CUSTOM FINISH	BASIS OF DESIGN
SG-1	WSB01 SWITCH	VERTICAL DISCHARGE GRILLE	DOUBLE DEFLECTION	ALUMINUM	16"x12"	16"x12"	530	NONE	EXPOSED DUCT	SWITCH				TUTTLE & BAILY - A54
SG-2	WSB01 DACS/TELCO	VERTICAL DISCHARGE GRILLE	DOUBLE DEFLECTION	ALUMINUM	16"x12"	16"x12"	450/510	NONE	EXPOSED DUCT	SWITCH				TUTTLE & BAILY - A54
SG-3	BATT/RECTIFIER RM	VERTICAL DISCHARGE GRILLE	DOUBLE DEFLECTION	ALUMINUM	16"x12"	16"x12"	640	NONE	EXPOSED DUCT	SWITCH				TUTTLE & BAILY - A54
SG-4	BATT/RECTIFIER RM	VERTICAL DISCHARGE GRILLE	DOUBLE DEFLECTION	ALUMINUM	10"x8"	10"x8"	250	NONE	EXPOSED DUCT	SWITCH				TUTTLE & BAILY - A54
SG-5	BATT/RECTIFIER RM	VERTICAL DISCHARGE GRILLE	DOUBLE DEFLECTION	ALUMINUM	26"x16"	26"x16"	1280	NONE	EXPOSED DUCT	SWITCH				TUTTLE & BAILY - A54
SG-6	VENDOR TELCO	VERTICAL DISCHARGE GRILLE	DOUBLE DEFLECTION	ALUMINUM	12"x8"	12"x8"	280	NONE	EXPOSED DUCT	SWITCH				TUTTLE & BAILY - A54
NOTES: 1. ALL UNITS SHALL BE ALUMINUM CONSTRUCTION AND WHITE IN COLOR														

1. ALL EQUIPMENT LISTED ON SHEET M603 IS EXISTING AND FOR REFERENCE ONLY.

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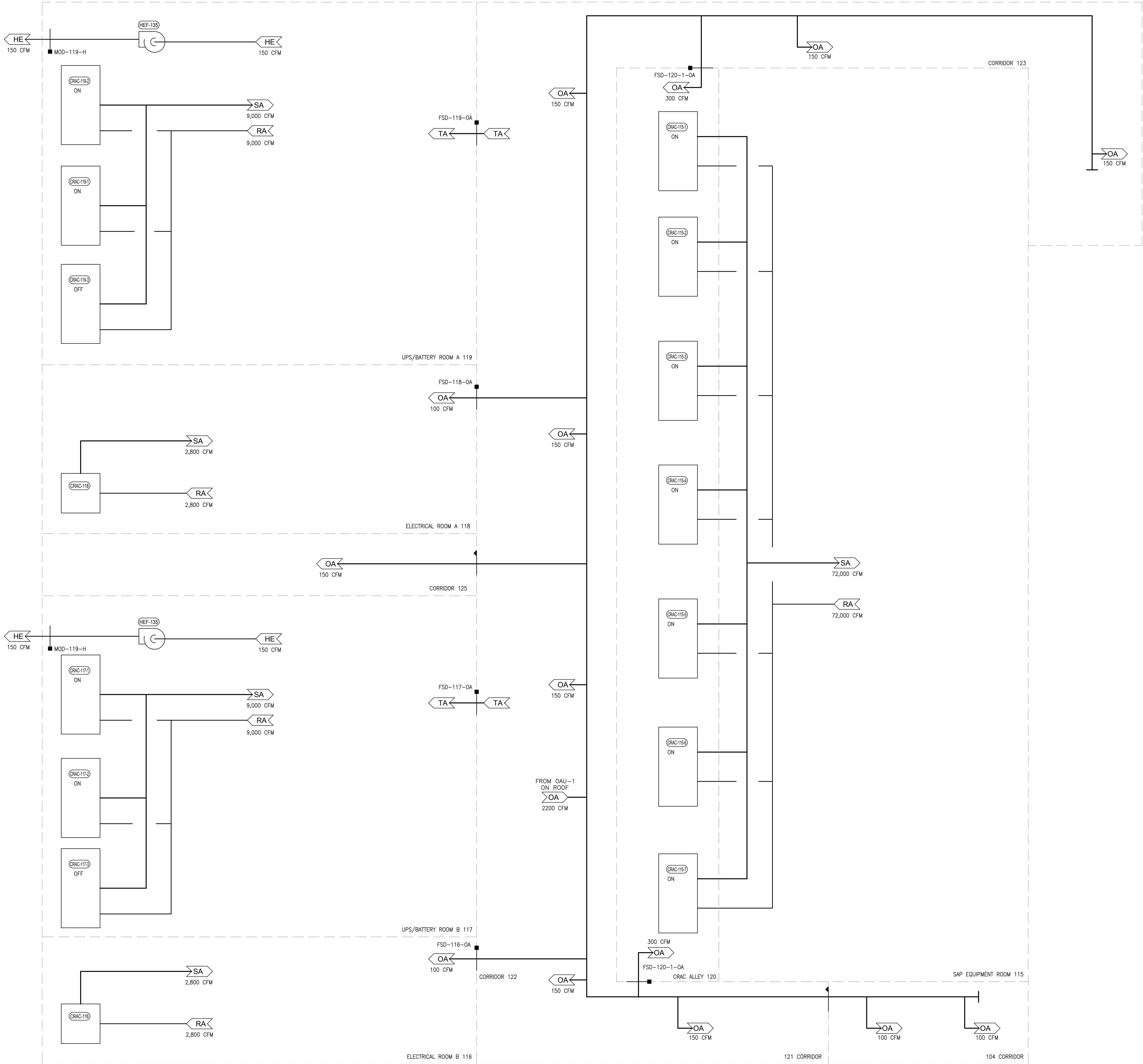
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1. ALL EQUIPMENT LISTED ON SHEET M605 IS EXISTING AND FOR REFERENCE ONLY.

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LAST MODIFIED: 2020/02/20 11:34 AM
EDITED BY: MARIANNA GANNY
FILE LOCATION: \\2020\2020\30x42\B_30x42.dwg
CADDIT: SHERIDAN, MA
PLOT: 30x42
PLOT DATE: 2/20/2020
PLOT BY: MARIANNA GANNY
PLOT SCALE: 1/8"=1'-0"



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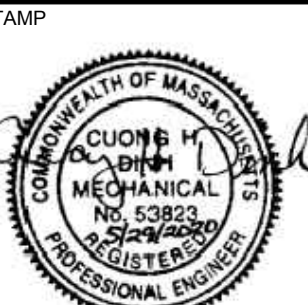
verizon

WESTBOROUGH MEC PHASE 2

400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

REV	DESCRIPTION	DATE
1	ADDENDUM #1	10/27/2017
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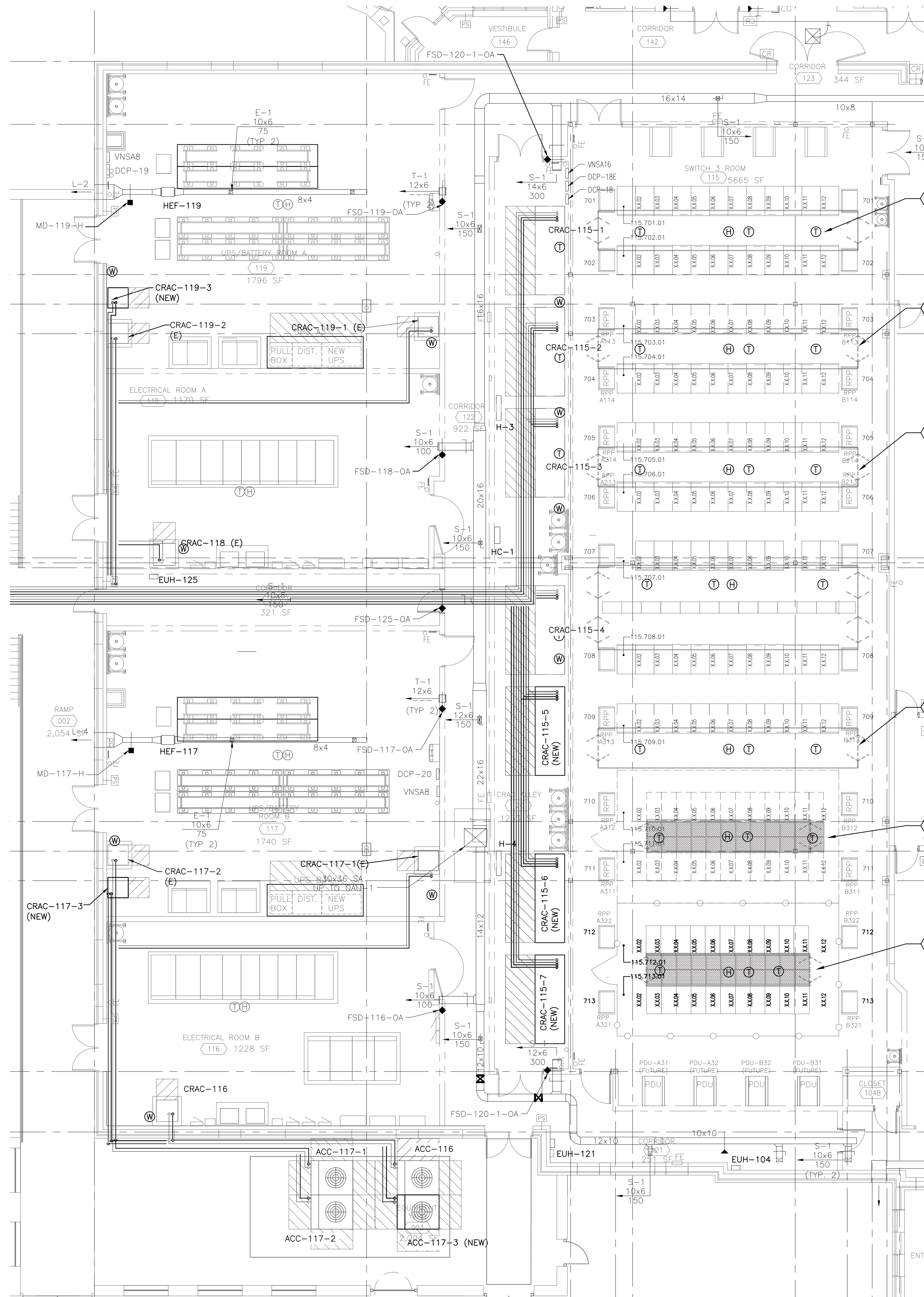
PROJECT NO:	200132400	STAMP
CAD DWG FILE:	200132400	
DESIGNED BY:	TM	
DRAWN BY:	CM	
CHECKED BY:	CD	
COPYRIGHT:	MARCH 2015	



SHEET TITLE
MECHANICAL AIRFLOW DIAGRAM

SHEET NUMBER
M701

[illegible]



GENERAL NOTES:

1. COORDINATE EQUIPMENT LOCATIONS WITH OTHER TRADES.
2. INSTALL NETWORK JACKS AS INDICATED ON BAS FLOOR PLANS.

KEY NOTES:

- 1 NEW (T) (H) IN COLD AISLE AS INDICATED
2 EXISTING (T) (H) TO REMAIN.

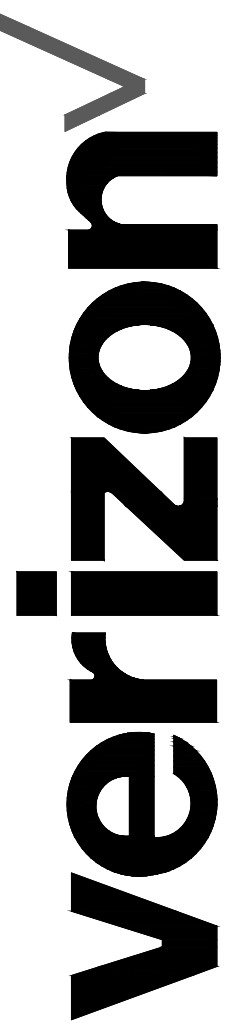


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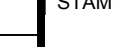
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△ REV	DESCRIPTION	DATE
1	BULLETIN No. 1	04.16.2020
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NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

PROJECT NO:	200132400	STAMP 
CAD DWG FILE:	200132400	
DESIGNED BY:	DD	
DRAWN BY:	CM	
CHECKED BY:	DD	
COPYRIGHT:	MARCH 2015	

SHEET TITLE

BUILDING AUTOMATION-
ENLARGED FLOOR PLAN

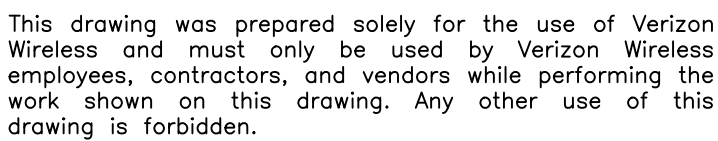
BA111



KEY NOTES:

① SEE BA501A FOR EXISTING BAS ARCHITECTURE

② CONNECT CRAC UNIT TO EXISTING NETWORK SWITCH. MATCH EXISTING.



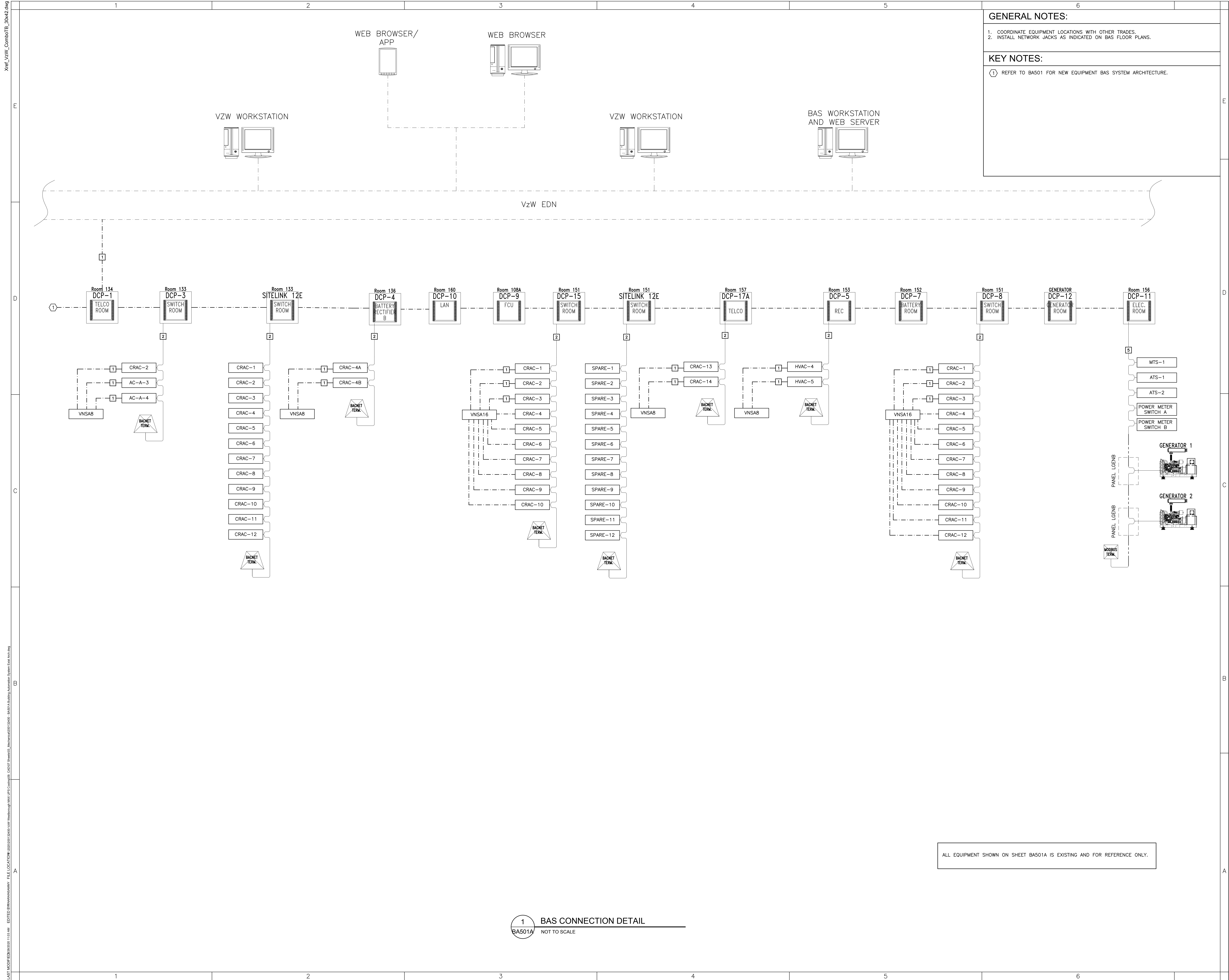
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(BA503) NOT TO SCALE

1. COORDINATE EQUIPMENT LOCATIONS WITH OTHER TRADES.
2. INSTALL NETWORK JACKS AS INDICATED ON BAS FLOOR PLANS.

- ① INTERLOCKING WIRING.
- ② CAT6 ETHERNET WIRING.
- ③ SEE BA705, BA706, BA707, & BA708 FOR ASSOCIATED ELECTRICAL POINTS TO BE PLACED IN DCP-14.

CRAC 117-3 COMPUTER ROOM AIR HANDLER (CRAC) SEQUENCE OF OPERATION

(3) DOWNFLOW CRACS, 1 NEW SHALL PROVIDE SUFFICIENT COOLING CAPACITY FOR THE UPS ROOM ROOM LOAD.

THE UNITS SERVING THE ROOM PROVIDE N+1 CAPACITY, BUT WILL WORK TOGETHER TO PREVENT THE NEED TO FOR STAGING BASED ON THE COOLING DEMAND AND UNIT FAILURE.

TEAMWORK MODE- THE UNITS ARE NETWORKED TOGETHER VIA STAND-ALONE ETHERNET CABLEING AND SWITCHES AND SETUP IN TEAMWORK MODE ENABLING CRACS DESIGNATED AS LEAD TO OPERATE TOGETHER TO MAINTAIN THE AREA SETPOINT. THIS MODE ALLOWS FOR THE ENABLING OF STANDBY UNITS ON LEAD UNIT FAILURE.

THE BUILDING ENGINEER SHALL ENABLE THE CRACS THROUGH THE BAS AND THE UNITS SHALL OPERATE CONTINUOUSLY.

IN ORDER TO FACILITATE THIS OPERATOR-BAS INTERFACE, IT IS CRITICAL THAT THE BAS BE ABLE TO DISPLAY AN ACCURATE GRAPHIC REPRESENTATION OF EACH SPACE THE RESPECTIVE CRAC UNIT SERVES. WITHIN THIS GRAPHIC REPRESENTATION, THE CRAC UNITS SHALL BE IDENTIFIED BY TAG NUMBERS. REFER TO CRAC UNIT SCHEDULE FOR CRAC TAG REFERENCES. ADDITIONALLY, DIFFERENT COLORS SHALL BE ASSIGNED TO THE CRAC UNITS DEPENDING ON THE UNIT STATUS. DIFFERENT COLORS SHALL IDENTIFY THE FOLLOWING CONDITIONS:

- UNIT OPERATING NORMALLY
- UNIT RECENTLY FAILED
- UNIT RECENTLY STARTED BY BAS
- UNIT OPERATING AUTO, REMOTE
- UNIT OPERATING MANUAL (LOCAL OR REMOTE)
- UNIT IN STANDBY

AFTER ALL ALARMS RELATED TO A FAILED CRAC UNIT HAVE BEEN CLEARED, THE ONLY COLOR INDICATION TO REMAIN SHALL BE FOR "UNIT OPERATING NORMALLY" AND "UNIT IN STAND-BY".

FANS WILL MODULATE BETWEEN MAXIMUM AND MINIMUM SPEED TO MAINTAIN THE RETURN AIR SETPOINT OF 77° (USER ADJ.)

THE DISCHARGE AIR TEMPERATURE SHALL BE MONITORED AT THE FRONT END BAS.

THE UNIT PROVIDES CRITICAL COOLING AND SHALL NOT BE DISABLED BY THE BAS DURING FIRE PROTECTION ZONE ALARM, GENERAL FIRE ALARM, FM200 RELEASE, OR SMOKE PURGE SEQUENCES.

AN ALARM SHALL BE ISSUED AT THE BAS WHENEVER THE CONTROLS SYSTEM SENSES ANY OF THE FOLLOWING CONDITIONS:

1. A DIRTY FILTER
2. THE UNIT FAN STOPS DURING NORMAL OPERATION OR FAILS TO START WHEN COMMANDED ON 5 MINUTE DURATION).
3. LEAK DETECTOR IN ALARM
4. COMPRESSOR FAILURE
5. LOW SUCTION PRESSURE
6. HIGH TEMPERATURE
7. HIGH HEAD PRESSURE
8. PHASE MONITOR

BAS SHALL MONITOR THE SPACE TEMPERATURE AND RELATIVE HUMIDITY AT EACH CRAC AND ACTIVATE AN ALARM ON THE FOLLOWING:

HIGH TEMPERATURE (85°F)
LOW TEMPERATURE (65°F)
HIGH HUMIDITY (85% RH)
LOW HUMIDITY (15% RH)

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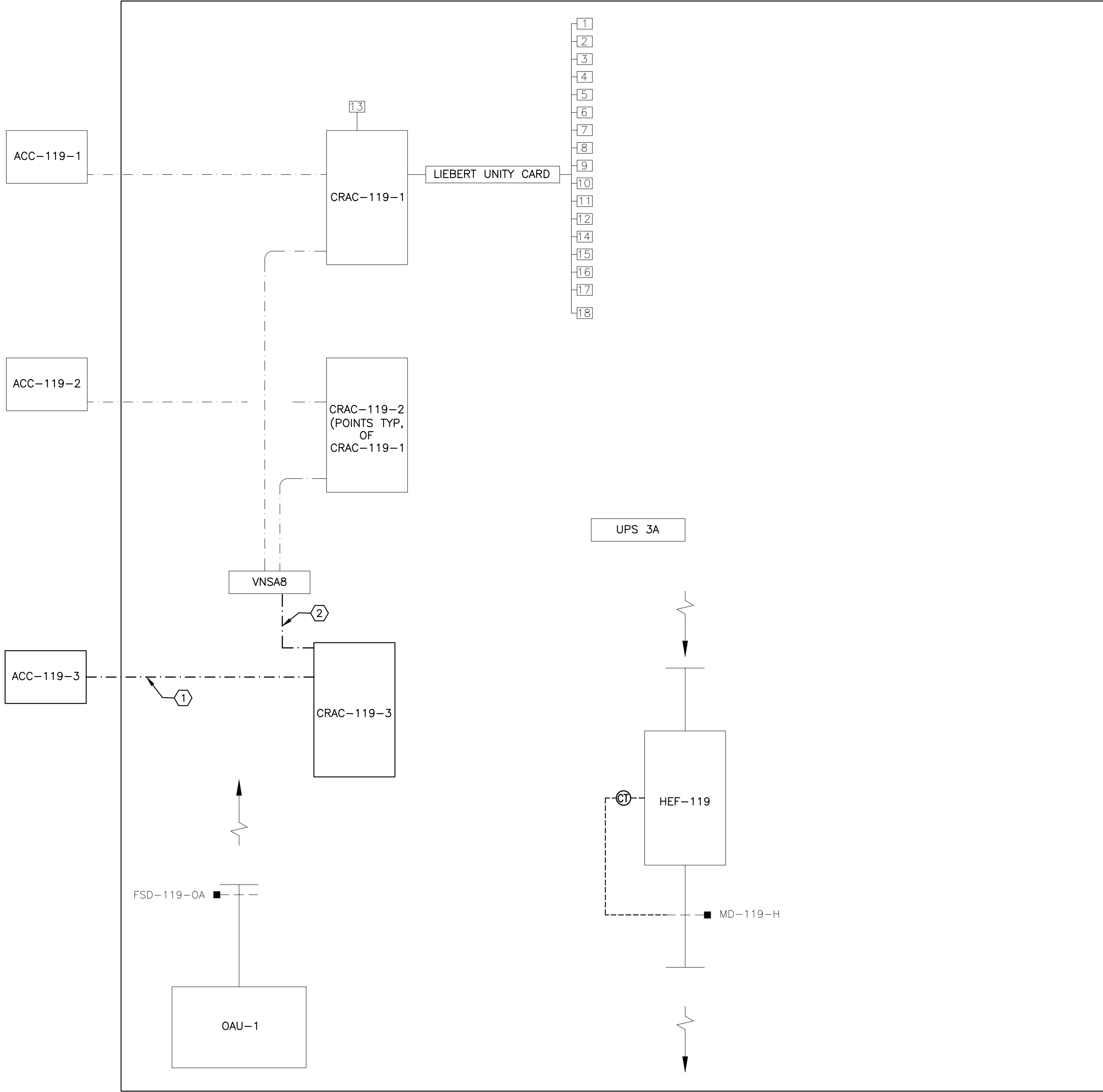
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DCP-20 POINTS LIST																						
		DDC HARD WIRED POINTS				EQUIPMENT INTERFACE		GUI APPLICATION				ALARMING SCENARIOS			ALARM PRIORITIES							
#	CONTROL POINTS		DIGITAL INPUTS	DIGITAL OUTPUTS	ANALOG INPUTS	ANALOG OUTPUTS	READ - DATA POINT	READ/WRITE - DATA POINT	TREND LOGGING	RUN TIME ACCUMULATION	OPERATION SCHEDULE	SCREEN DISPLAYED	USER OVERRIDE	LOW ALARM	HIGH ALARM	CHANGE OF STATE	COMMAND FAILURE	NOTIFICATION	MAINTENANCE	MAJOR - NOC ALARM	CRITICAL - NOC ALARM	SUPPLEMENTARY NOTES:
	CRAC UNIT 119-3																					
1																					TYPICAL FOR 2	
2	UNIT START/STOP							X	X	X	X	X						X				TYPICAL FOR 2
3	UNIT LEAD / LAG STATUS						X		X	X	X					X						TYPICAL FOR 2
4	FAN STATUS	X							X	X	X					X		X				TYPICAL FOR 2
5	FAN SPEED						X		X	X	X				X	X						TYPICAL FOR 2
6	SUPPLY AIR TEMPERATURE						X		X	X	X				X	X		X				TYPICAL FOR 2
7	RETURN AIR HUMIDITY						X		X	X	X				X	X		X				TYPICAL FOR 2
8	RETURN AIR TEMPERATURE						X		X	X	X											TYPICAL FOR 2
9	COOLING STATUS						X		X	X	X											TYPICAL FOR 2
10	CONDENSER ALARM						X		X	X					X			X		X		TYPICAL FOR 2
11	UNIT FAULT/FAILURE						X		X	X	X				X					X		TYPICAL FOR 2
12	LOSS OF AIRFLOW						X		X	X	X				X			X				TYPICAL FOR 2
13	CONDENSATE PUMP HIGH LEVEL						X		X	X	X				X							TYPICAL FOR 2
14	LEAK DETECTED						X		X	X	X							X				TYPICAL FOR 2
15	DIRTY FILTER						X		X	X	X				X				X			TYPICAL FOR 2
16	MASTER UNIT COMMUNICATION LOST						X		X	X	X							X				TYPICAL FOR 2
17	SERVICE REQUIRED						X				X	X						X				TYPICAL FOR 2
18	COMMON ALARM RELAYS	X							X	X	X				X			X	X	X		TYPICAL FOR 2



1 119 UPS ROOM POINTS
BA504 NOT TO SCALE

GENERAL NOTES:

- COORDINATE EQUIPMENT LOCATIONS WITH OTHER TRADES.
- INSTALL NETWORK JACKS AS INDICATED ON BAS FLOOR PLANS.

KEY NOTES:

- INTERLOCKING WIRING.
- CAT6 ETHERNET WIRING.
- SEE BA705, BA706, BA707, & BA708 FOR ASSOCIATED ELECTRICAL POINTS TO BE PLACED IN DCP-12.

SEQUENCE OF OPERATIONS:

CRAC 119-1&2 COMPUTER ROOM AIR HANDLER (CRAC) SEQUENCE OF OPERATION

GENERAL

(3) DOWNFLOW CRACS, 1 NEW SHALL PROVIDE SUFFICIENT COOLING CAPACITY FOR THE UPS ROOM ROOM LOAD.

THE UNITS SERVING THE ROOM PROVIDE N+1 CAPACITY, BUT WILL WORK TOGETHER TO PREVENT THE NEED TO FOR STAGING BASED ON THE COOLING DEMAND AND UNIT FAILURE.

TEAMWORK MODE - THE UNITS ARE NETWORKED TOGETHER VIA STAND-ALONE ETHERNET CABLING AND SWITCHES AND SETUP IN TEAMWORK MODE ENABLING CRACS DESIGNATED AS LEAD TO OPERATE TOGETHER TO MAINTAIN THE AREA SETPOINT. THIS MODE ALLOWS FOR THE ENABLING OF STANDBY UNITS ON LEAD UNIT FAILURE.

UNIT START/STOP

THE BUILDING ENGINEER SHALL ENABLE THE CRACS THROUGH THE BAS AND THE UNITS SHALL OPERATE CONTINUOUSLY.

BAS GRAPHICS

IN ORDER TO FACILITATE THIS OPERATOR-BAS INTERFACE, IT IS CRITICAL THAT THE BAS BE ABLE TO DISPLAY AN ACCURATE GRAPHIC REPRESENTATION OF EACH SPACE THE RESPECTIVE CRAC UNIT SERVES. WITHIN THIS GRAPHIC REPRESENTATION, THE CRAC UNITS SHALL BE IDENTIFIED BY TAG NUMBERS. REFER TO CRAC UNIT SCHEDULE FOR CRAC TAG REFERENCES. ADDITIONALLY, DIFFERENT COLORS SHALL BE ASSIGNED TO THE CRAC UNITS DEPENDING ON THE UNIT STATUS. DIFFERENT COLORS SHALL IDENTIFY THE FOLLOWING CONDITIONS:

- UNIT OPERATING NORMALLY
- UNIT RECENTLY FAILED
- UNIT RECENTLY STARTED BY BAS
- UNIT OPERATING AUTO, REMOTE
- UNIT OPERATING MANUAL (LOCAL OR REMOTE)
- UNIT IN STANDBY

AFTER ALL ALARMS RELATED TO A FAILED CRAC UNIT HAVE BEEN CLEARED, THE ONLY COLOR INDICATION TO REMAIN SHALL BE FOR "UNIT OPERATING NORMALLY" AND "UNIT IN STAND-BY".

TEMPERATURE CONTROL

FANS WILL MODULATE BETWEEN MAXIMUM AND MINIMUM SPEED TO MAINTAIN THE RETURN AIR SETPOINT OF 77° (USER ADJ.)

THE DISCHARGE AIR TEMPERATURE SHALL BE MONITORED AT THE FRONT END BAS.

ALARMS

THE UNIT PROVIDES CRITICAL COOLING AND SHALL NOT BE DISABLED BY THE BAS DURING FIRE PROTECTION ZONE ALARM, GENERAL FIRE ALARM, FM200 RELEASE, OR SMOKE PURGE SEQUENCES.

AN ALARM SHALL BE ISSUED AT THE BAS WHENEVER THE CONTROLS SYSTEM SENSES ANY OF THE FOLLOWING CONDITIONS:

- A DIRTY FILTER
- THE UNIT FAN STOPS DURING NORMAL OPERATION OR FAILS TO START WHEN COMMANDED ON 5 MINUTE DURATION).
- LEAK DETECTOR IN ALARM
- COMPRESSOR FAILURE
- LOW SUCTION PRESSURE
- HIGH TEMPERATURE
- HIGH HEAD PRESSURE
- PHASE MONITOR

BAS SHALL MONITOR THE SPACE TEMPERATURE AND RELATIVE HUMIDITY AT EACH CRAC AND ACTIVATE AN ALARM ON THE FOLLOWING:

HIGH TEMPERATURE (85°F)
LOW TEMPERATURE (65°F)
HIGH HUMIDITY (80% RH)
LOW HUMIDITY (15% RH)



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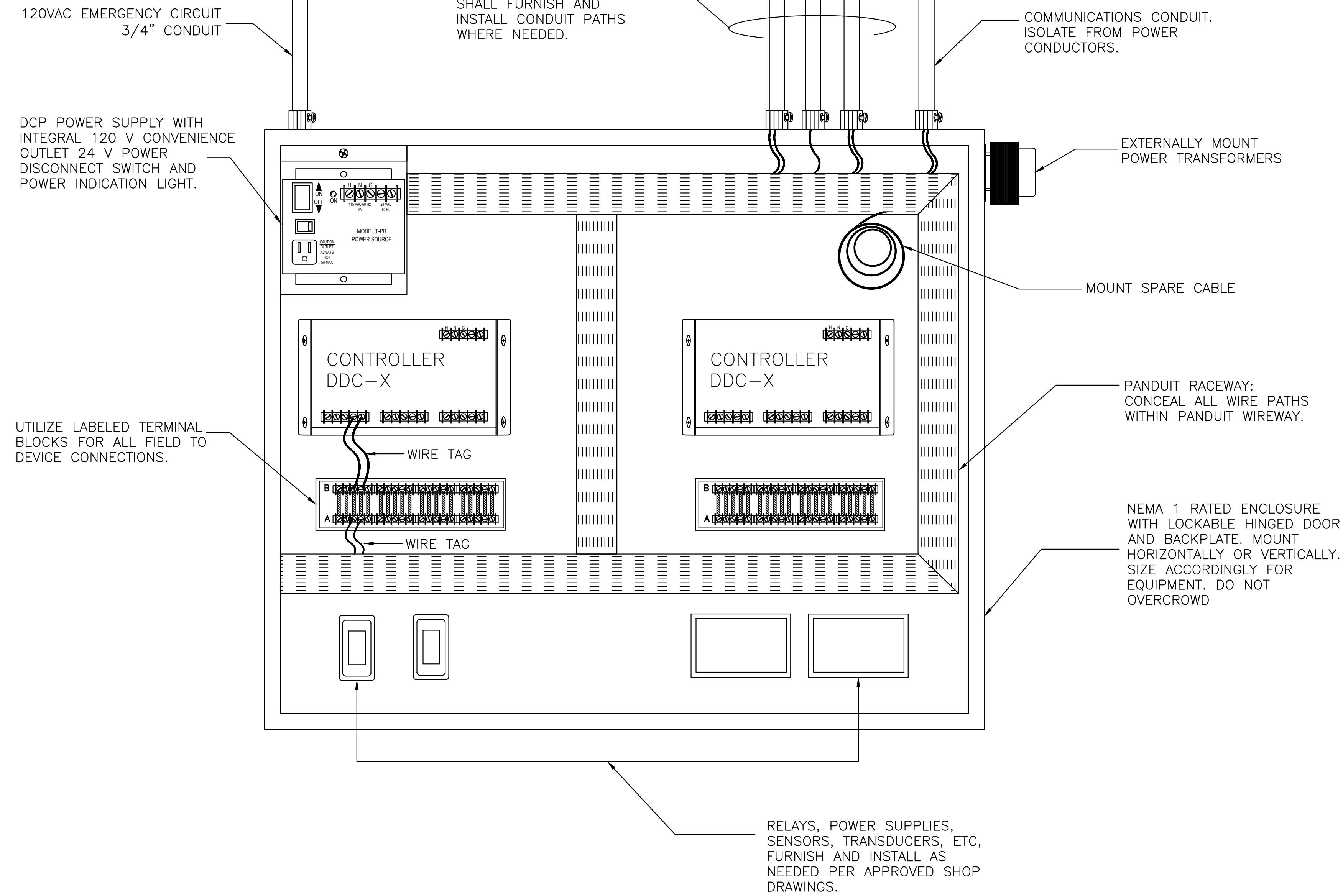


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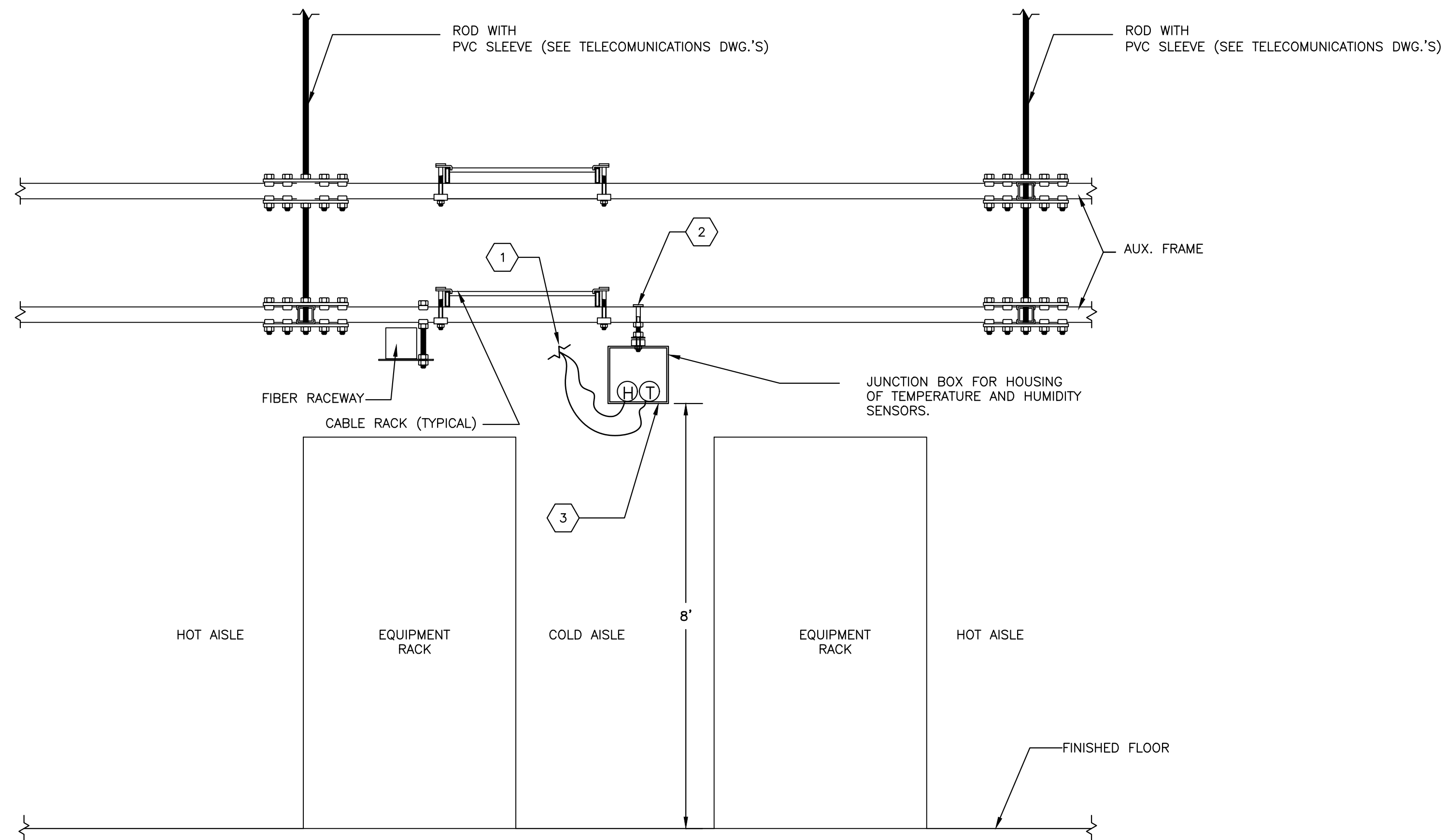
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400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

Δ	REV	DESCRIPTION	DATE
-			
-			
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-			
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-			
-			
NETWORK COMPLIANCE SUBMITTALS			DATE
ISSUED FOR EOS REVIEW			03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION			03.27.2020
REISSUED FOR CONSTRUCTION			04.16.2020
ISSUED FOR BUILDING PERMIT			05.29.2020

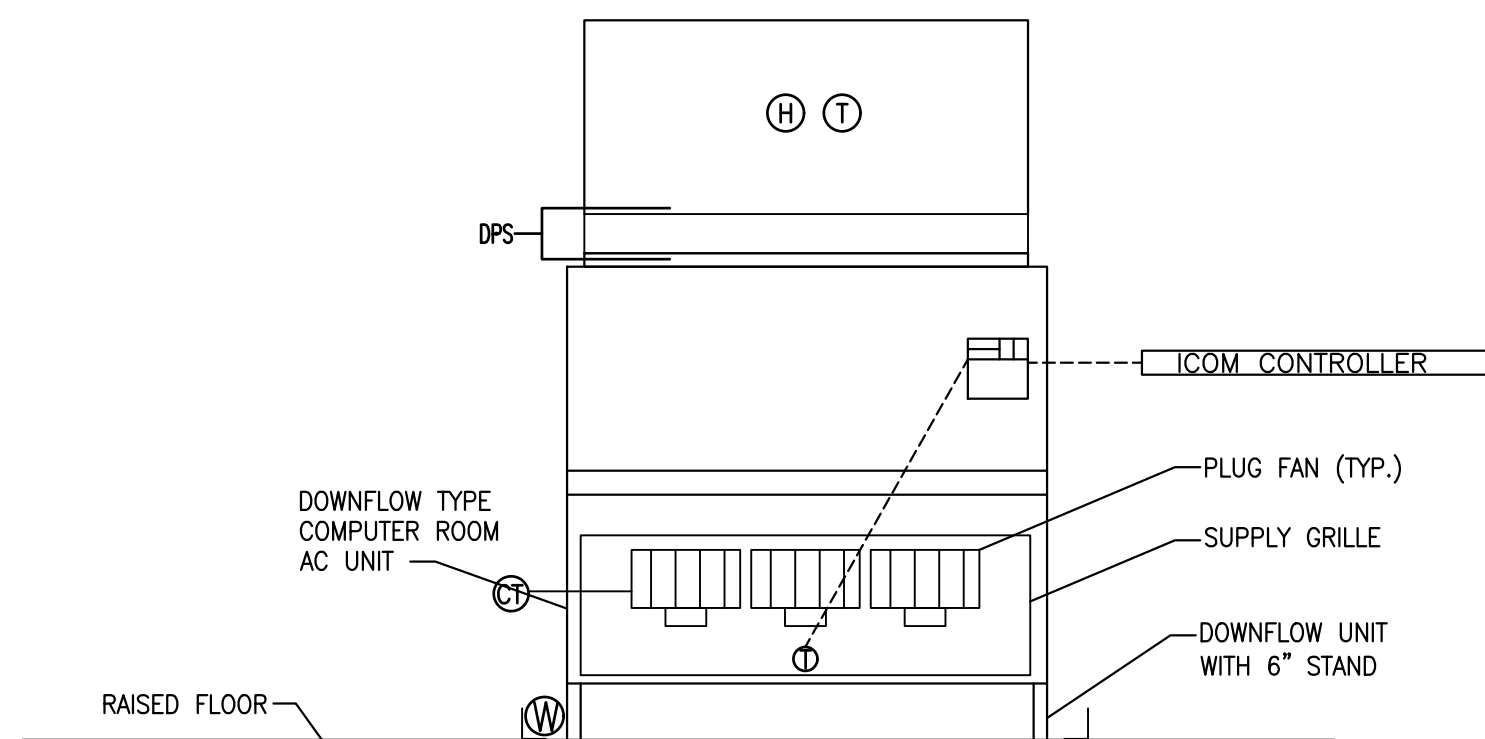


2 DIGITAL CONTROL PANEL
BA514 NOT TO SCALE

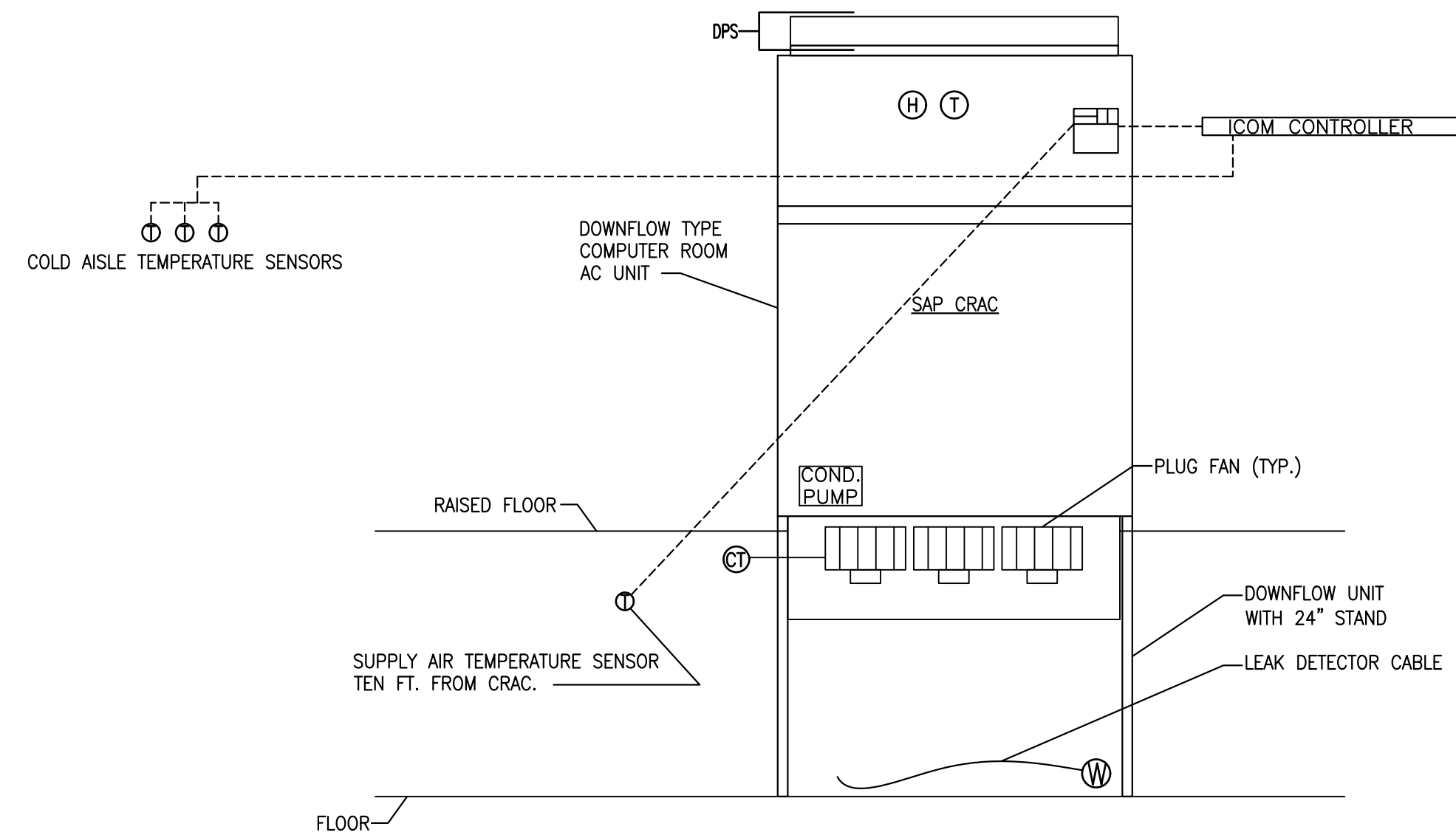
NOTES:
ALL POINTS SHOWN IN DIAGRAM ARE CONNECTED TO THE ICOM CONTROLLER



1 BAS WIRED SENSOR DETAILS
BA514 NOT TO SCALE



3 117&119 UPS ROOM CRAC
BA514 NOT TO SCALE



3 115 SAP EQUIPMENT ROOM CRAC
BA514 NOT TO SCALE

- GENERAL NOTES:

1. COORDINATE EQUIPMENT LOCATIONS WITH OTHER TRADES.
2. INSTALL NETWORK JACKS AS INDICATED ON BAS FLOOR PLANS.
3. THE PORTIONS OF THE BAS WHICH ARE USED TO CONTROL EQUIPMENT PERTAINING TO SMOKE CONTROL SHALL BE A UL 864 RATED SYSTEM. THE CONTRACTOR SHALL PROVIDE ADDITIONAL NETWORKS, SWITCHES, AND CONTROLLERS AS REQUIRED TO MEET THE MANUFACTURERS NETWORK ARCHITECTURE FOR A UL 864 RATED SYSTEM.
4. ARCHITECTURE DIAGRAM IS BASED ON BACNET IP/ETHERNET CONTROLLERS. CONTRACTOR TO SUBMIT ALTERNATE ARCHITECTURE FOR BACNET MS/TP FOR APPROVAL.

KEY NOTES:

- 1 CONTINUATION TO ON RACK UNTIL CLEAR OF AUX FRAMING. CONDUIT TO CRAC UNIT AND NOC FOR TERMINATION.
- 2 AUX FRAME MOUNTING TO BE USED FOR NOC ALARM HIGH/LOW TEMPERATURE SENSORS.
- 3 MOUNT CRAC UNIT SENSORS IN COLD AISLES OR AT COLD INTAKES OF EQUIPMENT. SENSORS SHALL BE MOUNTED SO NOT TO EXCEED 8' OF CLEARANCE FROM THE FLOOR, COORDINATE FINAL LOCATION WITH COMMISSIONING AGENT, MAINTAIN 3" OF CLEARANCE FROM ALL TASK LIGHTING FIXTURES OR OTHER SOURCES OF HEAT. PROVIDE BONDING AS NEEDED.

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[illegible]

1 NOC ALARM CONNECTION
BA702 NOT TO SCALE



		1										2										3									
EXISTING CIRCUIT BREAKERS - POINTS SUMMARY																															
		DDC HARD WIRED POINTS					INTEGRATION		GUI APPLICATION					ALARMING SCENARIOS				ALARM PRIORITIES													
#	POINT DESCRIPTION	DIGITAL INPUTS	DIGITAL OUTPUTS	ANALOG INPUTS	ANALOG OUTPUTS		READ - DATA POINT	READ / WRITE - DATA POINT		TREND LOGGING	RUN TIME ACCUMULATION	OPERATION SCHEDULE	SCREEN DISPLAYED	USER OVERRIDE		LOW ALARM	HIGH ALARM	CHANGE OF STATE	COMMAND FAILURE		NOTIFICATION	MAINTENANCE	MAJOR - NOC ALARM	CRITICAL - NOC ALARM	SUPPLEMENTARY NOTES:						
1	MSG-2 : SERVICE 2 MAIN 1	X								X			X					X			X			X							
2	MSG-2 : SERVICE 2 MAIN 2	X								X		X						X			X			X							
3	MSG-2: MDSGA	X								X			X					X			X			X							
4	MSG-2: MDSGB	X								X			X					X			X			X							
5	GTB-6A : ATS-GEN-6A	X								X			X					X			X			X							
6	GENERATOR 6A : ATS-GEN-6A	X								X			X					X			X			X							
7	GENERATOR 6A : ATS-GEN-7B	X								X			X					X			X			X							
8	GTB-7B : ATS-GEN-7B	X								X			X					X			X			X							
9	GENERATOR 7B : ATS-GEN-7B	X								X			X					X			X			X							
10	GENERATOR 7B : ATS-GEN-6A	X								X			X					X			X			X							
11	MDSGA MAIN BREAKER	X								X			X					X			X			X							
12	MDSGA : SPARE (QUANTITY 12)	X								X		X						X			X			X	TYPICAL FOR ALL SPARE						
13	MDSGA : UPS-A1 INPUT	X								X		X						X			X			X							
14	MDSGA : UPS-A2 INPUT	X								X			X					X			X			X							
15	MDSGA : UPS-A3 INPUT (FUTURE)	X								X			X					X			X			X							
16	MDSGA : UPS-A4 INPUT (FUTURE)	X								X			X					X			X			X							
17	MDSGA : UPS-B1 BYPASS	X								X			X					X			X			X							
18	MDSGA : UPS-B2 BYPASS	X								X			X					X			X			X							
19	MDSGA : UPS-B3 BYPASS (FUTURE)	X								X			X					X			X			X							
20	MDSGA : UPS-B4 BYPASS (FUTURE)	X								X			X					X			X			X							
21	MDSGA : HDPA	X								X			X					X			X			X							
22	MDSGA : HMA1	X								X			X					X			X			X							
23	MDSGA : HMA2	X								X			X					X			X			X							
24	MDSGA : TIE MDSGB	X								X			X					X			X			X							
25	MDSGB : MAIN BREAKER	X								X			X					X			X			X							
26	MDSGB : SPARE (QUANTITY 12)	X								X			X					X			X			X	TYPICAL FOR ALL SPARE						
27	MDSGB : UPS-B1 INPUT	X								X			X					X			X			X							
28	MDSGB : UPS-B2 INPUT	X								X			X					X			X			X							
29	MDSGB : UPS-B3 INPUT (FUTURE)	X								X			X					X			X			X							
30	MDSGB : UPS-B4 INPUT (FUTURE)	X								X			X					X			X			X							
31	MDSGB : UPS-A1 BYPASS	X								X			X					X			X			X							
32	MDSGB : UPS-A2 BYPASS	X								X			X					X			X			X							
33	MDSGB : UPS-A3 BYPASS (FUTURE)	X								X			X					X			X			X							
34	MDSGB : UPS-A4 BYPASS (FUTURE)	X								X			X					X			X			X							
35	MDSGB : HDPB	X								X			X					X			X			X							
36	MDSGB : HMB1	X								X			X					X			X			X							
37	MDSGB : HMB2	X								X			X					X			X			X							
38	MDSGB : TIE MDSGA	X								X			X					X			X			X							
39	PDU A2 MB	X								X			X					X			X			X							
40	PDU A3 MB	X								X			X					X			X			X							
41	PDU A1 MB (FUTURE)	X								X			X					X			X			X							
42	PDU A4 MB (FUTURE)	X								X			X					X			X			X							
43	PDU B2 MB	X								X			X					X			X			X							
44	PDU B3 MB	X								X			X					X			X			X							
45	PDU B1 MB (FUTURE)	X								X			X					X			X			X							
46	PDU B4 MB (FUTURE)	X								X			X					X			X			X							

		4				5						6									
AC UPS BATTERY - POINTS SUMMARY (TYPICAL FOR EACH BATTERY PLANT)																					
		DDC HARD WIRED POINTS				INTEGRATION		GUI APPLICATION				ALARMING SCENARIOS				ALARM PRIORITIES					
#	POINT DESCRIPTION	DIGITAL INPUTS	DIGITAL OUTPUTS	ANALOG INPUTS	ANALOG OUTPUTS	READ - DATA POINT	READ / WRITE - DATA POINT	TREND LOGGING	RUN TIME ACCUMULATION	OPERATION SCHEDULE	SCREEN DISPLAYED	USER OVERRIDE	LOW ALARM	HIGH ALARM	CHANGE OF STATE	COMMAND FAILURE	NOTIFICATION	LOCAL	NOC	REMOTE	SUPPLEMENTARY NOTES:
1	UPS A SUMMARY ALARM					X		X		X									X		
2	PDU A SUMMARY ALARM					X		X		X									X		
3	BATTERY A MONITOR ALARM					X		X		X									X		
4	UPS B SUMMARY ALARM					X		X		X									X		
5	PDU B SUMMARY ALARM					X		X		X									X		
6	BATTERY B MONITOR ALARM					X		X		X									X		
7	UPS SUMMARY ALARM					X		X		X								X			
8	BATTERY DISCONNECT OPEN					X		X		X								X			
9	BATTERY DISCHARGING					X		X		X								X			
10	BATTERY LOW					X		X		X								X			
11	RECTIFIER FAILURE					X		X		X								X			TYPICAL FOR EACH CELL
12	INVERTER FAILURE					X		X		X								X			TYPICAL FOR EACH CELL
13	UPS OUTPUT ON STATIC BYPASS					X		X		X								X			TYPICAL FOR EACH CELL
14	OUTPUT LOAD ON MAINT. BYPASS					X		X		X								X			TYPICAL FOR EACH CELL
15	BYPASS NOT AVAILABLE					X		X		X								X			TYPICAL FOR EACH CELL
16	OUTPUT OVERLOAD					X		X		X								X			TYPICAL FOR EACH CELL
17	UPS MODULE OVER TEMP.					X		X		X								X			TYPICAL FOR EACH CELL
18	BATTERY MONITOR ALARM					X		X		X								X			TYPICAL FOR EACH CELL
19	PDU SUMMARY ALARM					X		X		X								X			TYPICAL FOR EACH CELL
20	INPUT VOLTAGE RMS A-B					X		X		X							X				TYPICAL FOR EACH CELL
21	INPUT VOLTAGE RMS B-C					X		X		X							X				TYPICAL FOR EACH CELL
22	INPUT VOLTAGE RMS C-A					X		X		X							X				TYPICAL FOR EACH CELL
23	INPUT RMS CURRENT PHASE A					X		X		X							X				TYPICAL FOR EACH CELL
24	INPUT RMS CURRENT PHASE B					X		X		X							X				TYPICAL FOR EACH CELL
25	INPUT RMS CURRENT PHASE C					X		X		X							X				TYPICAL FOR EACH CELL
26	INPUT FREQUENCY					X		X		X							X				TYPICAL FOR EACH CELL
27	BYPASS INPUT FREQUENCY					X		X		X							X				TYPICAL FOR EACH CELL
28	BYPASS INPUT VOLTAGE RMS A-B					X		X		X							X				TYPICAL FOR EACH CELL
29	BYPASS INPUT VOLTAGE RMS B-C					X		X		X							X				TYPICAL FOR EACH CELL
30	BYPASS INPUT VOLTAGE RMS C-A					X		X		X							X				TYPICAL FOR EACH CELL
31	BATTERY TIME REMAINING					X		X		X							X				TYPICAL FOR EACH CELL
32	BATTERY VOLTAGE					X		X		X							X				TYPICAL FOR EACH CELL
33	OUTPUT RMS CURRENT PHS A					X		X		X							X				TYPICAL FOR EACH CELL
34	OUTPUT RMS CURRENT PHS B					X		X		X							X				TYPICAL FOR EACH CELL
35	OUTPUT RMS CURRENT PHS C					X		X		X							X				TYPICAL FOR EACH CELL
36	OUTPUT FREQUENCY					X		X		X							X				TYPICAL FOR EACH CELL
37	OUTPUT VOLTAGE RMS A-B					X		X		X							X				TYPICAL FOR EACH CELL
38	OUTPUT VOLTAGE RMS B-C					X		X		X							X				TYPICAL FOR EACH CELL
39	OUTPUT VOLTAGE RMS C-A					X		X		X							X				TYPICAL FOR EACH CELL
40	OUTPUT POWER					X		X		X							X				TYPICAL FOR EACH CELL
41	SYSTEM CAPACITY					X		X		X							X				TYPICAL FOR EACH CELL
NOTES: 1. ALL DC POWER ALARM POINTLISTS NEED TO COORDINATE WITH OWNER AND BE MODIFIED AS DIRECTED BY OWNER.																					



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△ REV	DESCRIPTION	DATE
△	ADDENDUM No. 1 - EOS COMMENTS	03.16.2020

NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

PROJECT NO:	200132400	STAMP
CAD DWG FILE:	200132400	
DESIGNED BY:	-	
DRAWN BY:	-	
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SHEET TITLE

**BUILDING AUTOMATION
ELECTRICAL POINTS LIST**

SHEET NUMBER

BA705

[illegible]

4				5				6													
REMOTE POWER PANELS - POINTS SUMMARY (TYPICAL FOR ALL RPP)																					
		DDC HARD WIRED POINTS				INTEGRATION		GUI APPLICATION				ALARMING SCENARIOS				ALARM PRIORITIES					
#	POINT DESCRIPTION	DIGITAL INPUTS	DIGITAL OUTPUTS	ANALOG INPUTS	ANALOG OUTPUTS	READ - DATA POINT	READ / WRITE - DATA POINT	TREND LOGGING	RUN TIME ACCUMULATION	OPERATION SCHEDULE	SCREEN DISPLAYED	USER OVERRIDE	LOW ALARM	HIGH ALARM	CHANGE OF STATE	COMMAND FAILURE	NOTIFICATION	MAINTENANCE	MAJOR - NOC ALARM	CRITICAL - NOC ALARM	SUPPLEMENTARY NOTES:
1	PANEL SUMMARY ALARM					X		X		X					X						
2	PANEL OVERVOLTAGE					X		X		X					X						
3	PANEL UNDERVOLTAGE					X		X		X					X						
4	PANEL PHASE OVERCURRENT					X		X		X					X						
5	PANEL NEUTRAL OVERCURRENT					X		X		X					X						
6	PANEL GROUND OVERCURRENT					X		X		X					X						
7	PANEL MAIN VOLTAGES A-B					X		X		X											
8	PANEL MAIN VOLTAGES B-C					X		X		X											
9	PANEL MAIN VOLTAGES C-A					X		X		X											
10	PANEL MAIN VOLTAGE A-N					X		X		X											
11	PANEL MAIN VOLTAGE B-N					X		X		X											
12	PANEL MAIN VOLTAGE C-N					X		X		X											
13	PANEL MAIN CURRENT A					X		X		X											
14	PANEL MAIN CURRENT B					X		X		X											
15	PANEL MAIN CURRENT C					X		X		X											
16	PANEL NEUTRAL CURRENT					X		X		X											
17	PANEL GROUND CURRENT					X		X		X											
18	PANEL MAIN OUTPUT KVA					X		X		X											
19	PANEL MAIN OUTPUT KWH					X		X		X					X						
20	PANEL MAIN OUTPUT POWER FACTOR					X		X		X					X						
21	BRANCH OVERCURRENT ALARM					X		X		X											
22	BRANCH UNDERCURRENT WARNING					X		X		X											
23	BRANCH BREAKER POSITION					X		X		X											
24	BRANCH CURRENT A					X		X		X											
25	BRANCH CURRENT B					X		X		X											
26	BRANCH CURRENT C					X		X		X											
27	BRANCH OUTPUT KW					X		X		X											
28	BRANCH OUTPUT KWH					X		X		X											
29	BRANCH OUTPUT POWER FACTOR					X		X		X											

POWER DISTRIBUTION UNITS - POINTS SUMMARY (TYPICAL FOR ALL NEW PDU)																					
		DDC HARD WIRED POINTS				INTEGRATION		GUI APPLICATION				ALARMING SCENARIOS				ALARM PRIORITIES					
#	POINT DESCRIPTION	DIGITAL INPUTS	DIGITAL OUTPUTS	ANALOG INPUTS	ANALOG OUTPUTS	READ - DATA POINT	READ / WRITE - DATA POINT	TREND LOGGING	RUN TIME ACCUMULATION	OPERATION SCHEDULE	SCREEN DISPLAYED	USER OVERRIDE	LOW ALARM	HIGH ALARM	CHANGE OF STATE	COMMAND FAILURE	NOTIFICATION	LOCAL	NOC	REMAINING	SUPPLEMENTARY NOTES:
1	OUTPUT OVERVOLTAGE					X		X		X									X		
2	OUTPUT UNDERVOLTAGE					X		X		X									X		
3	OUTPUT OVERCURRENT					X		X		X									X		
4	GROUND OVERCURRENT					X		X		X									X		
5	TRANSFORMER OVERTEMPERATURE POWEROFF					X		X		X									X		
6	OUTPUT UNDERVOLTAGE					X		X		X									X		
7	OUTPUT OVERCURRENT					X		X		X									X		
8	TRANSFORMER OVERTEMPERATURE					X		X		X									X		
9	INPUT VOLTAGE A-B					X		X		X							X				
10	INPUT VOLTAGE B-C					X		X		X							X				
11	INPUT VOLTAGE C-A					X		X		X							X				
12	OUTPUT VOLTAGE X-Y					X		X		X							X				
13	OUTPUT VOLTAGE Y-Z					X		X		X							X				
14	OUTPUT VOLTAGE Z-X					X		X		X							X				
15	OUTPUT CURRENT Ix					X		X		X							X				
16	OUTPUT CURRENT Iy					X		X		X							X				
17	OUTPUT CURRENT Iz					X		X		X							X				
18	OUTPUT POWER (KW)					X		X		X							X				

4				5				6			
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△ REV	DESCRIPTION	DATE
△	ADDENDUM No. 1 - EOS COMMENTS	03.16.2020

NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

PROJECT NO: 200132400 CAD DWG FILE: 200132400 DESIGNED BY: - DRAWN BY: - CHECKED BY: - COPYRIGHT: MARCH 2015	STAMP 
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SHEET TITLE

**BUILDING AUTOMATION
ELECTRICAL POINTS LIST**

SHEET NUMBER

BA706

1	2	3
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4	5	6	
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[illegible]

[illegible]

SCALE: 1/16" = 1'-0"



Diagram illustrating three types of fire protection systems:

- PREACTION SPRINKLER**: Represented by a rectangle with diagonal hatching.
- EXISTING FM200 TO REMAIN**: Represented by a rectangle with vertical hatching.
- NEW FM200**: Represented by a rectangle with horizontal hatching.

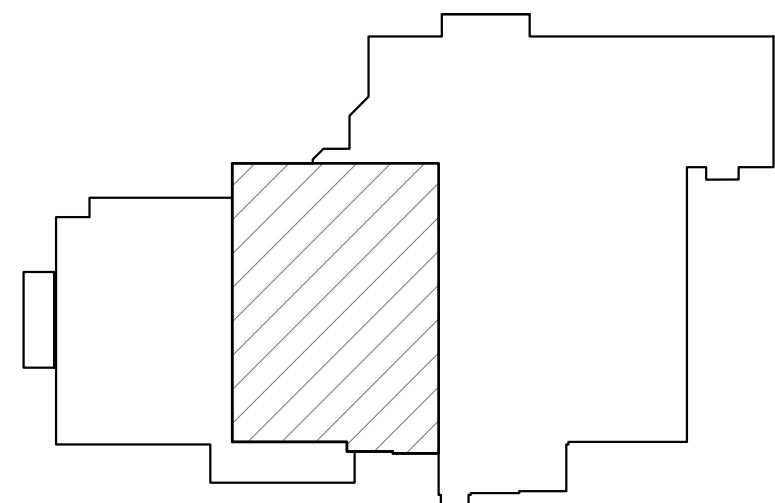
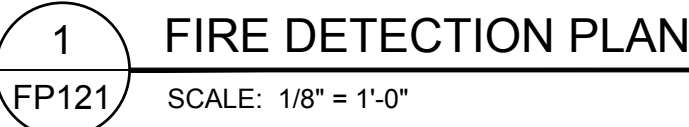
BLDG. LOCATION	400 FRIBERG PARKWAY	DATE:	1/15/1998
TEST MADE BY:	FIRE PUMP TESTING CO.	TIME:	9:30 AM
REPRESENTATIVE OF:			
CONTROL HYDRANT NO.:			
LOCATION:	130 FRIBERG PARKWAY		
RESIDUAL PRESSURE:	50 PSI		
STATIC PRESSRUE:	55 PSI		
FLOW HYDRANT NO.:			
LOCATION:	200 FRIBERG PARKWAY		
RESIDUAL PRESSURE:			
TOTAL GPM:	628 GPM:		
TEST MADE ON MAIN SIZE?			
CONSUMPTION RATE DURING TEST:			
SIZE NOZZLE:			
CONTRACTOR SHALL OBTAIN A NEW FLOW TEST PRIOR TO DESIGN INITIATION. COORDINATE WITH WESTBOROUGH PUBLIC WORKS.			

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WESTBOROUGH MEC PHASE 2
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

PROJECT NO:	200132400	STAMP
CAD DWG FILE:	200132400	
DESIGNED BY:	DD	
DRAWN BY:	-	
CHECKED BY:	DD	
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SHEET NUMBER **FP110**



KEY PLAN

① NOT USED

② NOT USED

③ NEW VESDA PIPING FOR NEW CRAC UNIT TO COMPLY WITH RETURN AIR SPACING CRITERIA
PERFORM ASPIRE CALCULATION TO PROVE PERFORMANCE OF DETECTOR WITH ADDITIONAL HOLES.

1455 LINCOLN PARKWAY, SUITE 500
ATLANTA, GA 30346
TEL:770.379.8500 FAX:770.379.8501
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WESTBOROUGH MEC PHASE 2

400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

[illegible]

OPERATION MATRIX INDICATES THE FOLLOWING:

- PRE-ALARM / 1ST ALARM CONDITION – NOTIFICATION WITHIN AN FM-200 PROTECTED SPACE:
 - (1) VEWFD OR (1) EWFd GOES INTO PRE-ALARM A FLASHING AMBER LIGHT WITHIN THE SPACE AND IN THE CONTROL ROOM SHALL START FLASHING. THIS IS A PRE-ALARM STATE ONE (1) DEVICE IN ALARM. LIGHT SHALL ALSO FLASH ON ALARM OF ANY ONE DEVICE WITHIN THE PROTECTED SPACE.
- 2ND ALARM CONDITION – NOTIFICATION WITHIN A FM-200 PROTECTED SPACE:
 - (1) VEWFD CROSS ZONED WITH ANY (1) EWFd OR (2) EWFd. THE BELL GOES OFF WITHIN THE PROTECTED SPACE AND YOU HAVE 30 SECONDS TO INVESTIGATE, ABORT THE DISCHARGE OR EVACUATE THE SPACE. AT THIS TIME THE BUILDING FIRE ALARM NOTIFICATION DEVICES ARE GOING OFF BUILDING WIDE.
- FM-200 DISCHARGE CONDITION ANY PROTECTED SPACE:
 - THE RED FLASHING LIGHT STARTS FLASHING AT THE ENTRANCE TO THE SPACE AND IN THE CONTROL ROOM.
- ALARM CONDITION ANY SPACE:
 - THE BUILDING FIRE ALARM SYSTEM IS BUILDING WIDE TO MEET CODE REQUIREMENTS FOR EVACUATION. THE BUILDING FIRE ALARM STROBES OR HORN/STROBES OPERATE IN ALL AREAS OF THE FACILITY INCLUDING THE CLEAN AGENT ZONES.

● INDICATES DESIRED RESPONSE

NOTE:

A	B	C	D	E	F
---	---	---	---	---	---

ACTIVATING THE ABORT STATION INTERRUPTS THE COUNTDOWN AS LONG AS IT IS MAINTAINED. IF THE ABORT STATION IS RELEASED, THE COUNTDOWN WILL RESET TO 30 SECONDS. THE DELAY OF CLEAN AGENT RELEASE IS TO PROVIDE ENOUGH TIME FOR PERSONNEL TO EVACUATE AND DOORS TO CLOSE.

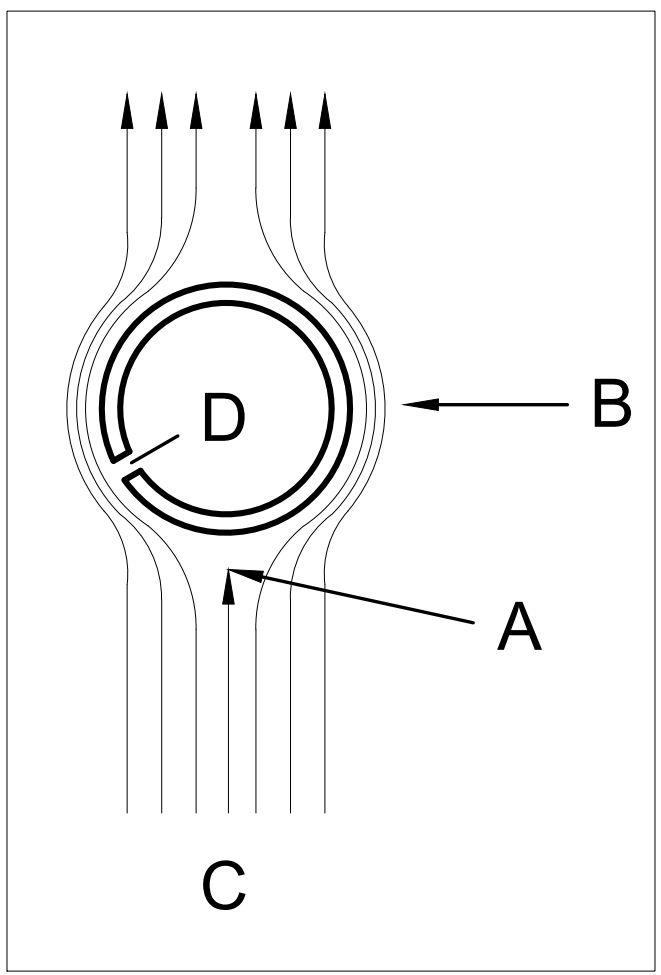
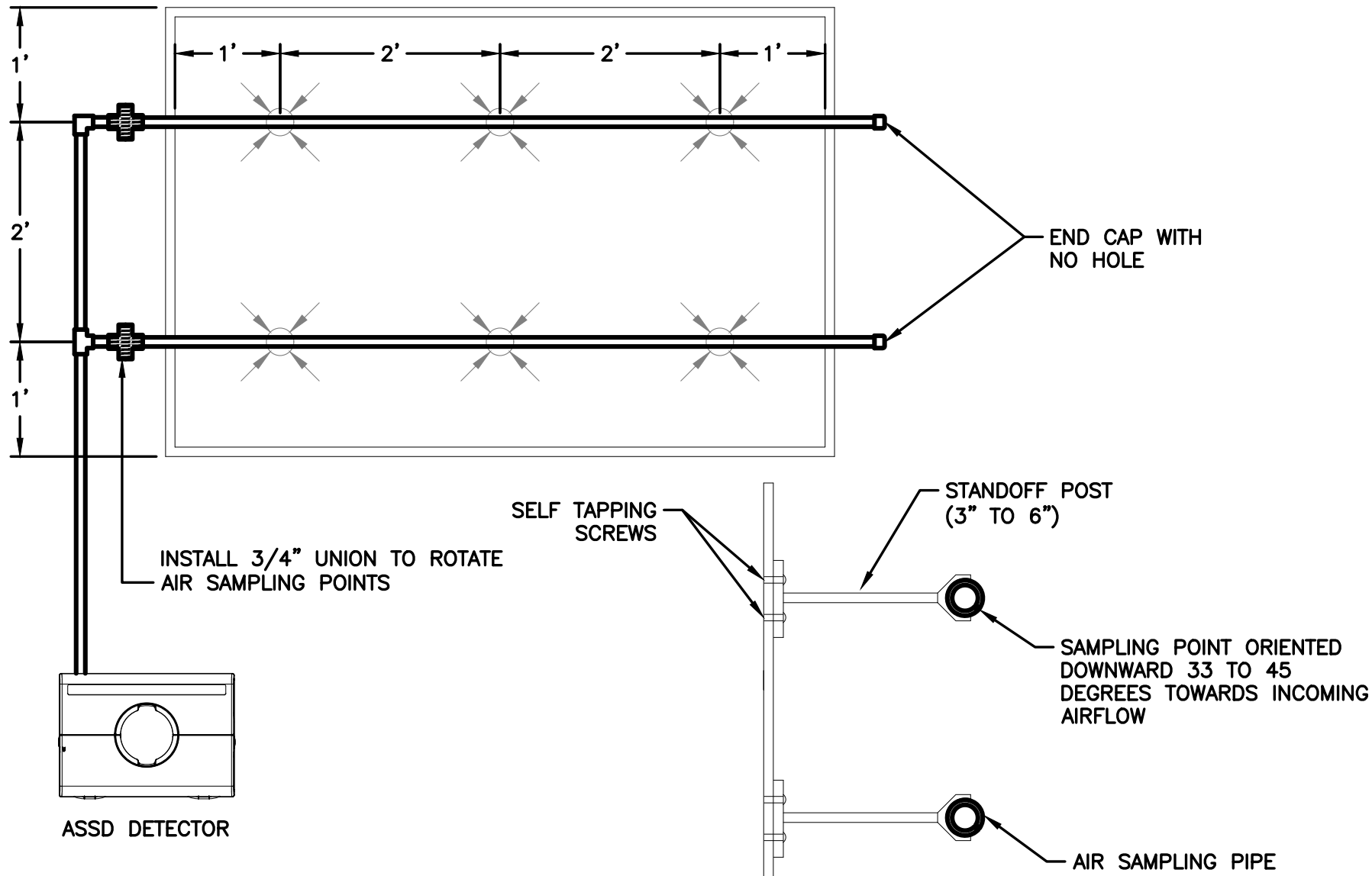
BUILDING FIRE ALARM NOTIFICATION DEVICES SHALL BE INSTALLED THROUGHOUT THE BUILDING AS PER NFPA-72, CURRENT EDITION.

ADDITIONAL PRE-ALARM LIGHTS AND SECOND ALARM BELLS MAY BE REQUIRED DEPENDING ON SIZE OF ROOM.

1 TYPICAL AIR INTAKE GRILLE SAMPLING DETAIL - TOP RETURN
FP601 NOT TO SCALE

KEY NOTES

- ① CONTRACTOR IS RESPONSIBLE TO COORDINATE DIVISION OF WORK BETWEEN TRADES TO CAPTURE THE FULL SCOPE OF WORK.



A	LOW VELOCITY (HIGH STATIC PRESSURE) AREA
B	HIGH VELOCITY (LOW STATIC PRESSURE) AREA
C	AIR STREAMLINES (AIR FLOW DIRECTION)
D	SAMPLING POINT (SEE NOTE 1.)

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WESTBOROUGH MEC PHASE 2
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

Δ	REV	DESCRIPTION	DATE
1		BULLETIN No. 1	04.16.2020
	•		
	•		
	•		
	•		
	•		

NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

PROJECT NO:	200132400	STAMP
CAD DWG FILE:	200132400	
DESIGNED BY:	DD	
DRAWN BY:	-	
CHECKED BY:	DD	
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SHEET TITLE

FIRE PROTECTION
SCHEDULES

FP601

ABBREVIATIONS		(NOTE: NOT ALL ABBREVIATIONS MAY HAVE BEEN USED FOR THIS PROJECT)	
E	A A/C ACEG AF AFD AFV AFG AHF AIC AL ANN ANSI	AMPS, AMPERES AIR CONDITIONER ALTERNATING CURRENT AC EQUIPMENT GROUNDING AMPERE FRAME ADJUSTABLE FREQ. DRIVE AFTER FINISHED FLOOR ABOVE FINISHED GRADE AUTHORITY HAVING JURISDICTION HANDLING UNIT AMPERES INTERRUPTING CAPACITY ALUMINUM ANNUNCIATOR AMERICAN NATIONAL STANDARDS INSTITUTE	HO HOA HORIZ HRS HPF HPS HUPS HSP HTR HV/LVP HVAC HZ
	APPR ARCH ARF AS ASD ASSO	APPROXIMATE ARCHITECT/ARCHITECTURAL ABOVE RAISED FLOOR AMPERE SWITCH ASD AIR SAMPLING SMOKE DETECTION SYSTEM AMERICAN SOCIETY OF HEATING, REFRIGERATION, HEATING, AND AIR CONDITIONING ENGINEERS AUTOMATIC TRIP AUTOMATIC TRANSFER SWITCH AMERICAN WIRE GAUGE	ICGB ID IDF IEEE IMC IN IS ISC ISOCGB IG INST INSTR I2S IZG
	ASHRAE	BUILDING AUTOMATION SYSTEM BUILDING AUTOMATION CABINET BATTERY BARE COPPER / BELOW CEILING BOILER CONTROL PANEL BACKBONE DISTRIBUTION FRAME BOW FINISHED GRADE BACKBOARD BREAKER BUILDING BUILDING BUILDING MANAGEMENT SYSTEM BARE STRANDED TINNED COPPER	JB KAIC KCMIL KV KVA KW
	C CAB CBB CCV CCVE CEWA	CONDUIT CABINET CIRCUIT BREAKER CENTER TO CENTER CLOSED CIRCUIT TELEVISION CLOSED CIRCUIT VIDEO EQUIPMENT CRITICAL ELECTRICAL WORK AUTHORIZATION CONTRACTOR FURNISHED, CONTRACTOR INSTALLED COLLECTOR GROUND BAR FOR LEAD S	L LCP LPS LTG LU LV LVL
	CFCI CGBS	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED COLLECTOR GROUND BAR FOR LEAD S	MAX MCC MCCB MCM MCCB MCP MDF MECH MFG MFR MG MH MIC MIN MISC
	CHWP CIRC CKT CL CLG CLR CMU COL COMM CONC CONTR COW COWBG	CHILLED WATER PUMP CIRCULATION CIRCUIT CENTER LINE CEILING CLEAR CONCRETE MASONRY UNIT CONDUIT ONLY WITH PULL ROPE COLUMN COMMUNICATIONS CONCRETE CONTRACTOR CELLSISTE ON WHEELS CELLSISTE ON WHEELS AREA GROUND BAR	MOTOR CONTROL CENTER MAIN CIRCUIT BREAKER THOUSAND CIRCULAR MILS MIL CIRCUIT PROTECTOR MAIN DISTRIBUTION FRAME MECHANICAL MANUFACTURING MANUFACTURER MOTOR GENERATOR MASTER GROUND BAR MANHOLE, METAL HALIDE MICROPHONE MINIMUM MISCELLANEOUS
	CPT CR CS CSI	CONTROL POWER TRANSFORMER CIRCUIT RELAY CONTROL SWITCH CONSTRUCTION SPECIFICATIONS INSTITUTE	MLO MOTOR OPERATED DAMPER METHOD OF PROCEDURE MAIN POINT OF ENTRY MOTD MOUNTED HEIGHT MTS MANUAL SWITCHBOARD MSC MOBILE SWITCHING CENTER MSG MASTER/MAN SYSTEM GROUND BUS MERG MERCURY VAPOR, MEDIUM VOLTAGE MVA
	CTR CU CW CT CTL	CENTER COPPER COMPLETE WITH CURRENT TRANSFORMER CONTROL	MTG HT MISB MVS MVA
	D DB DC DC1 DC2 DDC DET DI DISC DIST DN DP DPST DR DS DSU DWG	DEEP, DEPTH DIRECT BURIAL DIRECT CURRENT DC PLANT #1 DC PLANT #2 DIRECT DIGITAL CONTROL DET DIAMETER DISCONNECT DISTRIBUTION DMS METERING SYSTEM (CUSTOMER METERING) DOWN DOWNSATION PANEL DOUBLE POLE SINGLE THROW DOOR DOW SPOT DISCONNECTION SWITCH UNIT DRAWING	<N> NEW NEUTRAL NURSE CALL, NORMALLY CLOSED NATIONAL ELECTRICAL CODE NESC NOT IN CONTRACT NIGHT LIGHT NORMALY OPEN, NUMBER NOT TO SCALE
	EA EAS EBD EBU EC EEW EFC EGC EL ELEV ELR EM EMO EMS ENCL EPO EPR EQ EQUIP ESD EWH EX <EX> <ER>	EACH ENVIRONMENTAL ALARM SYSTEM ENCLOSED BURIAL EMERGENCY LIGHTING BATTERY UNIT EMPTY CONDUIT ENERGIZED ELECTRICAL WORK EXHAUST FAN EQUIPMENT GROUNDING CONDUCTOR ELEVATION ELECTRICAL ELEVATOR END-OF-LINE RESISTOR EMERGENCY EMERGENCY MACHINE OFF ENERGY MANAGEMENT SYSTEM ENCLOSURE/METALLIC TUBING ENCLOSURE/ENCLOSED ENERGY POWER OFF ETHYLENE PROPYLENE RUBBER EQUIPMENT EQUIPMENT EMERGENCY SHUTDOWN ELECTRIC WATER COOLER ELECTRIC WATER/WALL HEATER EXTERIOR EXISTING EXISTING TO REMAIN	OC OD OFCI OPCD OH OFGB OS P PA PB PCD PCDF PCU PDF PDU PFI P/I PH, ø PH, ø PANE PNC PRI PRT P/T P/T/T PVC PWR P&C Q R <R> <RE>
	FA FAA FAP FAT FACP FCPS FD FDR FE FEC FPHY FH FIC	FIRE ALARM FIRE ALARM ANNUNCIATOR FIRE ALARM PANEL FIRE ALARM TERMINAL CABINET FIRE ALARM CONTROL PANEL FIELD CHARGING POWER SUPPLY FLOOR DRAIN FEEDER FIRE EXTINGUISHER FIRE EXTINGUISHER CABINET FACTORY FINISH, FINISH FACE FULL HEIGHT FURNISHED AND INSTALLED BY CONTRACTOR FINISHED FITURE FULL LOAD AMPERES FLEXIBLE FLOOR FLUORESCENT FURNISHED BY OWNER INSTALLED BY CONTRACTOR FACILITY MANAGEMENT CONTROL SYSTEM FIRE SUPPRESSION FIRE FIGHTER SMOKE CONTROL SYSTEM FIRE/SMOKE DAMPER FIRE SUPPRESSION CONTROL PANEL FLOOR SYSTEM GROUND BUS FEET/FOOT FUSE FUTURE FULL VOLTAGE NON-REVERSING	OC ON CENTER / OVER COUNTER OUTSIDE DIAMETER OWNER FURNISHED, CONTRACTOR INSTALLED OVERCURRENT PROTECTION DEVICE OVERHEAD OVERHEAD PRINCIPAL GROUND BAR OCCUPANCY SENSOR POLE PUBLIC ADDRESS PUSHBUTTON PHOTOELECTRIC CELL POWER CONTROL DISTRIBUTION POWER CONTROL DISTRIBUTION FRAME POWER CONTROL UNIT PROTECTOR DISTRIBUTION FRAME POWER DISTRIBUTION UNIT PASSIVE INFRARED PROVIDE AND INSTALL PANELBOARD PANE POINT OF CONNECTION PRIMARY POTENTIAL TRANSFORMER PAN/T PAN/TILT/ZOOM POLYVINYL CHLORIDE POWER POWER & COMMUNICATION QUALITY RELOCATED REMOVED NEW LOCATION OF RELOCATED DEVICE RECEPTACLE REQUIRED EXISTING TO BE RELOCATED RIGID GALVANIZED STEEL CONDUIT RIGID METALLIC CONDUIT (GALVANIZED) ROOT-MEAN-SQUARE RMS NON-METALLIC CONDUIT RAPID START S/C SBJ SBTC SCA SCHE SCU SEC SEC SMOK SHT SN SP SOV SPECFS SPC SPS SPST ST STANDY STD STP SUBST SUB SW SWBD SWITCH SWGR SW1 SW2 SYM
	G.GND GALV GEC GEN GF GFI GRG GRZ GFI GPSGB GWB	GROUND GALVANIZED GROUNDING ELECTRODE CONDUCTOR GENERAL, GENERATOR GROUND FAULT GROUND FAULT INTERRUPTER GALVANIZED RIGID CONDUIT GROUNDING RIGID STEEL CONDUIT GROUND FAULT CIRCUIT INTERRUPTER GPS ANTENNA GROUND BAR GROUND WINDOW BAR	LENGTH, LONG LIGHTING CONTROL PANEL LOW PRESSURE SODIUM LIGHTING LOCAL UTILITY LOW VOLTAGE LEVEL MAXIMUM MOTOR CONTROL CENTER MAIN CIRCUIT BREAKER THOUSAND CIRCULAR MILS MIL CIRCUIT PROTECTOR MAIN DISTRIBUTION FRAME MECHANICAL MANUFACTURING MANUFACTURER MOTOR GENERATOR MASTER GROUND BAR MANHOLE, METAL HALIDE MICROPHONE MINIMUM MISCELLANEOUS MAIN LUGS ONLY MOTOR OPERATED DAMPER METHOD OF PROCEDURE MAIN POINT OF ENTRY MOTD MOUNTED HEIGHT MTS MANUAL TRANSFER SWITCH MAIN SWITCHBOARD MSC MOBILE SWITCHING CENTER MSG MASTER/MAN SYSTEM GROUND BUS MERG MERCURY VAPOR, MEDIUM VOLTAGE MVA
	H HDC HH HID	HIGH HEAT DETECTOR HANDHOLE HIGH INTENSITY DISCHARGE	HIGH OUTPUT HAND-OFF-AUTO HORIZONTAL HORSEPOWER HIGH POWER FACTOR HIGH PRESSURE SODIUM HOUSE LAMP HOUSE SERVICE PANEL HEATER HIGH VOLTAGE, HIGH VOLTAGE POWER HEATING, VENTILATION AND AIR CONDITIONING HERTZ INTERCOM INTERGATED COLLECTION GROUND BAR INSIDE DIAMETER INTERMEDIATE DISTRIBUTION FRAME INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INTERMEDIATE METAL CONDUIT INCH INSTANT START INTERUPTING SHORT CIRCUIT ISOLATED COLLECTION GROUND BAR ISOLATED GROUND INSTANTANEOUS INSTRUMENT ISOLATED GROUND SYSTEM ISOLATED GROUND ZONE JUNCTION BOX KILO (THOUSAND) AMPERES INTERUPTING CAPACITY KILO (THOUSAND) CIRCULAR MILS KILO (THOUSAND) VOLTS KILO (THOUSAND) WATT-AMPERES REACTIVE KILO (THOUSAND) WATT-HOURS LENGTH, LONG LIGHTING CONTROL PANEL LOW PRESSURE SODIUM LIGHTING LOCAL UTILITY LOW VOLTAGE LEVEL MAXIMUM MOTOR CONTROL CENTER MAIN CIRCUIT BREAKER THOUSAND CIRCULAR MILS MIL CIRCUIT PROTECTOR MAIN DISTRIBUTION FRAME MECHANICAL MANUFACTURING MANUFACTURER MOTOR GENERATOR MASTER GROUND BAR MANHOLE, METAL HALIDE MICROPHONE MINIMUM MISCELLANEOUS MAIN LUGS ONLY MOTOR OPERATED DAMPER METHOD OF PROCEDURE MAIN POINT OF ENTRY MOTD MOUNTED HEIGHT MTS MANUAL TRANSFER SWITCH MAIN SWITCHBOARD MSC MOBILE SWITCHING CENTER MSG MASTER/MAN SYSTEM GROUND BUS MERG MERCURY VAPOR, MEDIUM VOLTAGE MVA
A	H HDC HH HID	HIGH HEAT DETECTOR HANDHOLE HIGH INTENSITY DISCHARGE	HIGH OUTPUT HAND-OFF-AUTO HORIZONTAL HORSEPOWER HIGH POWER FACTOR HIGH PRESSURE SODIUM HOUSE LAMP HOUSE SERVICE PANEL HEATER HIGH VOLTAGE, HIGH VOLTAGE POWER HEATING, VENTILATION AND AIR CONDITIONING HERTZ INTERCOM INTERGATED COLLECTION GROUND BAR INSIDE DIAMETER INTERMEDIATE DISTRIBUTION FRAME INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INTERMEDIATE METAL CONDUIT INCH INSTANT START INTERUPTING SHORT CIRCUIT ISOLATED COLLECTION GROUND BAR ISOLATED GROUND INSTANTANEOUS INSTRUMENT ISOLATED GROUND SYSTEM ISOLATED GROUND ZONE JUNCTION BOX KILO (THOUSAND) AMPERES INTERUPTING CAPACITY KILO (THOUSAND) CIRCULAR MILS KILO (THOUSAND) VOLTS KILO (THOUSAND) WATT-AMPERES REACTIVE KILO (THOUSAND) WATT-H

ELECTRICAL LEGEND:	
RACEWAY SYMBOLS:	
SYMBOL	DESCRIPTION
	HOMERUN TO PANEL AND CIRCUIT BREAKER NOTED.
	PROVIDE PHASE CONDUCTORS AS SCHEDULED.
	PROVIDE NEUTRAL CONDUCTOR AS SCHEDULED.
	PROVIDE INSULATED EQUIPMENT GROUND CONDUCTOR AS SCHEDULED.
	VOICE AND DATA RACEWAY = 3/4" EMPTY CONDUIT, UNLESS NOTED OTHERWISE.
	BRANCH CIRCUIT TO FEED MANUFACTURED PARTITION SYSTEM
	SOUND SYSTEM RACEWAY
	RACEWAY CONCEALED IN WALL OR ABOVE CEILING
	RACEWAY EXPOSED
	24 VDC EMERGENCY LIGHTING BRANCH CIRCUIT – (2) #10–1/2" – UNLESS NOTED OTHERWISE.
	FLEXWIRE RACEWAY
	NEW RACEWAY
	EXISTING RACEWAY TO REMAIN
	LIGHTNING PROTECTION CABLE
	GROUNDING CABLE
	EQUIPMENT RELOCATED
	RACEWAY CONCEALED IN FLOOR SLAB, BELOW SLAB OR GRADE, OR UNDER RAISED ACCESS FLOOR
	SINGLE PHASE(Ø) ABOVEGROUND PRIMARY SERVICE
	SINGLE PHASE(Ø) UNDERGROUND PRIMARY SERVICE
	SINGLE PHASE(Ø) ABOVEGROUND SECONDARY SERVICE
	SINGLE PHASE(Ø) UNDERGROUND SECONDARY SERVICE
	2 PHASE(Ø) ABOVEGROUND PRIMARY SERVICE
	2 PHASE(Ø) UNDERGROUND PRIMARY SERVICE
	2 PHASE(Ø) ABOVEGROUND SECONDARY SERVICE
	2 PHASE(Ø) UNDERGROUND SECONDARY SERVICE
	3 PHASE(Ø) ABOVEGROUND PRIMARY SERVICE
	3 PHASE(Ø) UNDERGROUND PRIMARY SERVICE
	3 PHASE(Ø) ABOVEGROUND SECONDARY SERVICE
	3 PHASE(Ø) UNDERGROUND SECONDARY SERVICE
	EQUIPMENT ABANDONED
	CABLE TRAY
	DENOTES CONDUIT TURNING UP IN PLAN VIEW
	DENOTES CONDUIT TURNING DOWN IN PLAN VIEW
REFERENCE SYMBOLS:	
SYMBOL	DESCRIPTION
	DENOTES SHEET TITLE.
	DENOTES SCALE OF DRAWING.
	DENOTES DRAWING NUMBER AND SHEET NUMBER.
	DENOTES NOTE TITLE.
	MATCH LINE
	DENOTES ELEVATION.
	DENOTES ENLARGED PLAN OR DETAIL.
	DENOTES A SECTION CUT.
	KEYNOTE SYMBOL.
	DENOTES REVISION.
	EXISTING TO REMAIN.
	DENOTES EXISTING TO BE REPLACED.
	DENOTES WEATHERPROOF DEVICE.
	RECTIFIER
	INVERTER
	AUTOMATIC TRANSFER SWITCH WITH BYPASS ISOLATION SWITCHES
	STATIC TRANSFER SWITCH – CONTINUOUS DUTY OR MOMENTARY RATED
	UNFUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	DISCONNECT SWITCH BY OTHERS
	COMBINATION MOTOR STARTER AND DISCONNECT
	AUTOMATIC TRANSFER
	CONTACT—NORMALLY CLOSED
	CONTACT—NORMALLY OPEN

(NOTE: ALL SYMBOLS SHOWN MAY NOT APPEAR)	
LIGHTING SYMBOLS:	
SYMBOL	DESCRIPTION
	RECESSED FLUORESCENT LIGHT FIXTURE
	RECESSED EMERGENCY FLUORESCENT LIGHT FIXTURE
	SURFACE OR PENDANT MTD. FLUORESCENT FIXTURE
	SURFACE OR PENDANT MTD. EMERGENCY FLUORESCENT FIXTURE
	WALL MTD. FLUORESCENT FIXTURE
	WALL MTD. EMERGENCY FLUORESCENT FIXTURE
	STRIP LIGHT FIXTURE
	RECESSED INCANDESCENT OR FLUORESCENT DOWN LIGHT FIXTURE (CENTER IN TILE)
	RECESSED INCANDESCENT OR FLUORESCENT EMERGENCY DOWN LIGHT FIXTURE (CENTER IN TILE)
	SURFACE MOUNTED WALL INCANDESCENT OR HID LIGHT FIXTURE
	WALL MOUNTED EXIT LIGHT
	DIRECTIONAL EXIT LIGHT
	EMERGENCY WALL/CEILING PACK FIXTURE WITH AIMABLE HEAD
	POLE MOUNTED SITE FIXTURE
	POLE MOUNTED DUAL SITE FIXTURE
	POLE MOUNTED DUAL SITE FIXTURE AT 90°
	POLE MOUNTED TRI SITE FIXTURE
	POLE MOUNTED QUAD SITE FIXTURE
	FLOOD FIXTURE
	SINGLE POLE SWITCH
	TWO SINGLE POLE SWITCHES UNDER COMMON FACEPLATE CONNECTED FOR INNER/OUTER CONTROL OF LAMPS
	THREE SINGLE POLE SWITCHES UNDER COMMON FACEPLATE
	THREE WAY SWITCH
	(2) THREE-WAY SWITCHES UNDER COMMON FACEPLATE CONNECTED FOR INNER/OUTER OF LAMPS FROM TWO LOCATIONS
	FOUR WAY SWITCH
	WALL BOX DIMMER 1000W UNLESS OTHERWISE NOTED
	WEATHER PROOF SWITCH
	MOTOR RATED SWITCH
	COMBINATION OF OCCUPANCY SENSOR AND OVERRIDE
	PILOT SWITCH, SINGLE POLE WITH ILLUMINATED HANDLE
	TIMER SWITCH - DIGITAL UNLESS NOTE OTHERWISE
	LOW VOLTAGE SWITCH FOR LIGHTING CONTROL SYSTEM.
	OCCUPANCY SENSING SWITCH FOR LIGHTING CONTROL, SUBSCRIPT NOTES SENSOR TYPE
	WALL MOUNTED OCCUPANCY SENSING SWITCH FOR LIGHTING CONTROL, SUBSCRIPT NOTES SENSOR TYPE
	SWITCH ADAPTER FOR FLEX WIRING SYSTEM.
	LIGHTING CONTACTOR
	TIME CLOCK
	PHOTO CELL
	OCCUPANCY SENSOR POWER PACK
POWER SYMBOLS:	
SYMBOL	DESCRIPTION
	EMERGENCY POWER OFF
	WALL MOUNTED JUNCTION BOX
	JUNCTION BOX
	WEATHERPROOF JUNCTION BOX
	FLOOR MOUNTED JUNCTION BOX
	UNFUSED DISCONNECT SWITCH, RATING/POLES/NAME RATING
	FUSED DISCONNECT SWITCH, RATING/POLES/NAME RATING/FUSE SIZE
	FUSED DISCONNECT SWITCH, RATING/POLES/NAME RATING/XX (FUSED PER MANUFACTURER'S REQUIREMENTS)
	DISCONNECT BY OTHERS
	COMBINATION MOTOR STARTER AND DISCONNECT
	WATER HEATER
	PANEL
	EXISTING OR NEW EQUIPMENT AS INDICATED
	HAND HOLE
	MAN HOLE (REFERENCE SPECIFICATIONS)
	CONDUIT
	120V, 1Ø DIRECT CONNECTION AS NOTED
	208V, 3Ø DIRECT CONNECTION AS NOTED
	277V, 1Ø DIRECT CONNECTION AS NOTED
	480V, 3Ø DIRECT CONNECTION AS NOTED
	REMOTE PUSH BUTTON
	SPECIAL PURPOSE RECEPTACLE, AMPERAGE, VOLTAGE, AND NEMA CONFIGURATION AS NOTED
	120V, DUPLEX RECEPTACLE
	120V, COUNTER TOP DUPLEX RECEPTACLE
	120V, DEDICATED DUPLEX RECEPTACLE
	GROUND FAULT INTERRUPTER DUPLEX RECEPTACLE
	120V, FLOOR BOX WITH DUPLEX RECEPTACLE AND VOICE/DATA ACTIVATIONS AS NOTED
	WEATHER PROOF GROUND FAULT INTERRUPTER DUPLEX RECEPTACLE
	120V, QUADRUPEX RECEPTACLE
	120V, DUPLEX RECEPTACLE WITH INVERTER POWER
	120V, QUADRUPEX RECEPTACLE WITH INVERTER POWER
	120V, DUPLEX RECEPTACLE FOR TV POWER
	SPECIAL PURPOSE RECEPTACLE OR PLUG, TYPE AS NOTED
	120V, SQUARE OR ROUND FLOOR BOX WITH (1) DUPLEX RECEPTACLE
	FLOOR BOX WITH DUPLEX RECEPTACLE AND VOICE/DATA ACTIVATIONS AS NOTED
	PHOTO ELECTRIC SWITCH
	ON-OFF TIME CLOCK
	LIGHTING CONTACTOR
	POWER POLE WITH VOICE/DATA & POWER RACEWAYS
	CEILING MOUNTED OCCUPANCY SENSOR
	POWER POLE
	POWER METER
	PULL BOX
	CABINET
	ELECTRIC METER
	MOTOR

5			
ALL DRAWINGS AND ARE USED AS APPLICABLE TO THIS PROJECT			
SECURITY SYMBOLS:			
SYMBOL	DESCRIPTION		
	AIPHONE HEAD-END		
	AIPHONE INTERCOM IN WEATHERPROOF ENCLOSURE-ROUGH-IN ONLY-COORDINATE REQUIREMENTS WITH VENDOR.		
	AIPHONE INTERCOM WITH CAMERA IN WEATHERPROOF ENCLOSURE-ROUGH-IN ONLY-COORDINATE REQUIREMENTS WITH VENDOR.		
	CAMERA		
	CAMERA (PTZ) DENOTES PAN/TILT/ZOOM		
	DOOR CONTACT- INTRUSION DETECTION SYSTEM		
	DOOR BELL HORN-ROUGH-IN ONLY-COORDINATE REQUIREMENTS WITH VENDOR		
	DOOR BELL HORN-ROUGH-IN ONLY-COORDINATE REQUIREMENTS WITH VENDOR		
	MAGNETIC DOOR HOLDER		
	MONITOR		
	MULTIPLEXER		
	VIDEO RECORDER		
	KEYBOARD		
	TEMPERATURE SENSOR		
	ACOUSTIC-TYPE BREAK GLASS SENSOR- INTRUSION DETECTION SYSTEM		
	MICROWAVE-PIR DUAL-TECHNOLOGY MOTION SENSORS-INTRUSION DETECTION SYSTEM		
	CARD READER		
	WEATHERPROOF CARD READER		
	KEYPAD INTEGRAL TO CARD READER		
	DOOR CONTACT FOR ACCESS CONTROL SYSTEM		
	DOOR BELL PUSH BUTTON-ROUGH-IN ONLY-COORDINATE REQUIREMENTS WITH VENDOR		
	MAGNETIC DOOR LOCK		
	REQUEST TO EXIT SENSOR IN PANIC BAR / OR LOCKSET		
	DIGITAL VIDEO RECORDER		
	CARD READER WITH KEYPAD		
	ACCESS CONTROL HEAD-END EQUIPMENT		
	VIDEO SURVEILLANCE HEAD-END EQUIPMENT		
	EMERGENCY EXIT BUTTON FOR BACKUP OF REM SENSOR FAILURE		
	REQUEST TO EXIT SENSOR ABOVE DOOR		
	CENTRAL STATION CONTROL UNIT-INTRUSION DETECTION SYSTEM		
	INTRUSION DETECTION SYSTEM ANNUNCIATOR PANEL		
	VIDEO SURVEILLANCE SYSTEM MONITORS		
	KNOX KEY SWITCH FOR FIRE DEPARTMENT ACCESS		
	KEY SWITCH		
	KEYPAD AND DISPLAY MODULE-INTRUSION DETECTION SYSTEM		
COMMUNICATION SYMBOLS:			
SYMBOL	DESCRIPTION		
	DOUBLE GANG DATA OUTLET & PLATE, (SEE SPEC'S)		
	WALL MOUNTED TELEPHONE OUTLET & PLATE, (SEE SPEC'S)		
	TELEPHONE, DOUBLE GANG TELEPHONE OUTLET & PLATE		
	TELEPHONE & DATA COMBINATION (2 DATA AND 2 TELEPHONE CONNECTION IN SINGLE PLATE)		
	TELEPHONE & DATA COMBINATION (2 DATA AND 2 TELEPHONE)		
	GPS ANTENNA		
	SATELLITE TV ANTENNA		
	DISH ANTENNA FOR DIRECT TV		
	ENERGY MANAGEMENT SYSTEM PANEL		
	ENERGY MANAGEMENT NETWORK PORT FOR WORKSTATION CONTROL		
	GENERATOR ALARM PANEL (REMOTE ANNUNCIATOR)		
	GENERATOR EMERGENCY STOP BUTTON		
	GENERATOR GENLINK PC STATION		
	TELEPHONE BACKBOARD		
	CEILING MOUNTED PAGING SYSTEM SPEAKER.		
	WALL MOUNTED PAGING SYSTEM SPEAKER.		
GROUNDING SYMBOLS:			
SYMBOL	DESCRIPTION		
	GROUND ROD C/W INSPECTION SLEEVE		
	GROUNDING ELECTRODE		
	GROUNDING LEAD NUMBER PER NSTD 33.		
	INSPECTION SLEEVE WITH DISCONNECTABLE MECHANICAL GROUND CONNECTION		
	GROUND BAR		
	EXOTHERMIC WELD CONNECTION		
	MECHANICAL CONNECTION (eg LUG, C-TAP)		
	AIR TERMINAL		
	TWO-HOLE LONG BARREL COMPRESSION LUG		
	HAND HOLE		
REFER TO			
MOUNTING HEIGHTS			
MOUNTING HEIGHTS SHALL BE TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED. DIFFERENT SIZES ARE USED AND MOUNTED NEXT TO EACH OTHER TO CENTER LINE.			
RECEPTACLES	18"	DISCONNECTS, TO TOP	72"
RECEPTACLE WIREWAYS	43"	JUNCTION BOXES	15"
SWITCHES	48"	VOLUME CONTROLS	48"
MOTOR STARTERS, TO TOP	72"	THERMOSTATS	48"
5			

PROJECT SCOPE AND RFP:

THE PROJECT SCOPE OF WORK THAT THE CONTRACTOR SHALL BE RESPONSIBLE FOR IS DEFINED BY RFP NO: _____ REQUEST FOR PROPOSAL FOR _____ AND INCLUDES THE FOLLOWING ATTACHMENTS:

ATTACHMENT A M/W/DV BE QUESTIONNAIRE.
ATTACHMENT B PROPOSED AGREEMENT.
ATTACHMENT C BID PROPOSAL - COST BREAKDOWN.
ATTACHMENT D PROJECT MANUAL (DRAWINGS AND SPECIFICATIONS).
ATTACHMENT E OTHER RELATED BID DOCUMENTS.
ATTACHMENT F VERIZON NETWORK STANDARDS.
ATTACHMENT G PROJECT ADDENDUMS AND CLARIFICATIONS.

THE RFP AND ALL ASSOCIATED ATTACHMENTS AND DOCUMENTS SHALL DEFINE THE COMPLETE PROJECT SCOPE OF WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL DOCUMENTS AND IS SOLELY RESPONSIBLE FOR ALL WORK.

ALL DOCUMENTS INCLUDED WITHIN THE PROJECT REQUEST FOR PROPOSAL ARE REQUIRED FOR THE COMPLETE PROJECT SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK (EQUIPMENT, MATERIAL, INSTALLATION, TESTING, ETC.) INDICATED IN ALL DOCUMENTS. RFP, ATTACHMENT A M/W/DV/BE QUESTIONNAIRE, EXECUTED AGREEMENT (ATTACHMENT B PROPOSED AGREEMENT), ATTACHMENT C BID PROPOSAL/COST BREAKDOWN, ATTACHMENT D PROJECT MANUAL (DRAWINGS AND SPECIFICATIONS), ATTACHMENT E OTHER RELATED BID DOCUMENTS, ATTACHMENT F VERIZON NETWORK STANDARDS AND PROJECT ADDENDUMS AND CLARIFICATIONS ARE COMPLEMENTARY TO EACH OTHER. THE CSI FORMAT OF THE SPECIFICATIONS AND DRAWING NUMBERING PER DISCIPLINE IS NOT INTENDED TO IMPLY SEGREGATION OF SUB CONTRACTOR WORK. CONTRACTOR SHALL ASSIGN ALL SUB CONTRACTOR WORK AND VERIZON WILL NOT ACCEPT ANY CHANGE ORDERS FOR INTERNAL CONTRACTOR WORK ASSIGNMENTS.

CONTRACTOR SHALL BE RESPONSIBLE FOR DISTRIBUTING ALL RFP DOCUMENTS TO THEIR SUB CONTRACTORS. ALL RFP DOCUMENTS ARE REQUIRED TO INDICATE THE PROJECT SCOPE OF WORK. PARTIAL SUBCONTRACTOR DOCUMENT PACKAGES ARE HIGHLY DISCOURAGED.

THE DRAWINGS, SPECIFICATIONS, REFERENCED STANDARDS, VERIZON WIRELESS STANDARDS, OTHER RFP ATTACHMENTS AND THE TERMS AND CONDITIONS ARE COMPLEMENTARY OF ONE ANOTHER. IN THE EVENT OF CONFLICT BETWEEN THE DRAWINGS, SPECIFICATIONS, REFERENCED STANDARDS, VERIZON WIRELESS STANDARDS, OTHER RFP ATTACHMENTS OR TERMS AND CONDITIONS, THE ARCHITECT / ENGINEER SHALL BE CONTACTED FOR FORMAL INTERPRETATION OF THE REQUIREMENT. THE CONTRACTOR SHALL BE DEEMED TO HAVE PROVIDED THE MOST DETAILED AND EXPENSIVE INTERPRETATION OF THE REQUIREMENT, ANY WORK INSTALLED IN CONFLICT WITH THE ARCHITECT / ENGINEER INTERPRETATION SHALL BE CORRECTED BY THE CONTRACTOR AT HIS EXPENSE AND AT NO EXPENSE TO OWNER.

ASSIGNMENT OF WORK: THE AGREEMENT BETWEEN THE CONTRACTOR AND THE OWNER IS A SINGLE PRIME CONTRACT. THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE SCOPE OF WORK INCLUDING THE CONSTRUCTION OF THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE PROJECT AND ANY INFERENCE TO DIVISION OF WORK IS A SUGGESTION ONLY. NEITHER THE OWNER NOR THE ARCHITECT / ENGINEER WILL OFFER, AT ANY TIME, ANY OPINIONS OR PROPOSED RESOLUTIONS CONCERNING ASSIGNMENT OF WORK TO SUBCONTRACTORS. IN THE EVENT OF MISSING OR CONFLICTING SCOPE PROVIDED BY THE CONTRACTOR OR ANY OF THE SUBCONTRACTORS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE WORK.

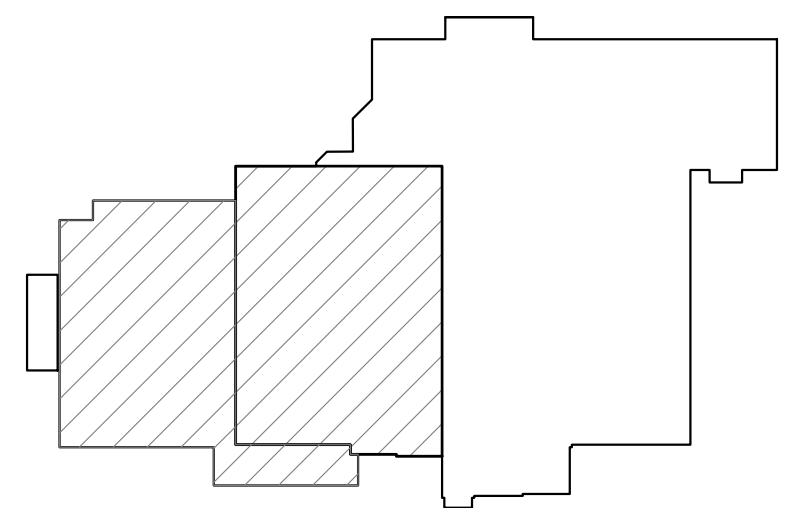
GENERAL NOTES:

1. COORDINATION:
A. EACH DIVISION SHALL COMPLY WITH THE G001 PROJECT GENERAL NOTES AS IF CONTAINED HEREIN.
B. CONTRACTOR SHALL SUBMIT COORDINATION DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR IS RESPONSIBLE FOR ASSEMBLY AND COORDINATION OF WORK WITHIN ALL DIVISIONS AND TRADES INTO A SINGLE PACKAGE.
2. DO NOT SCALE DRAWINGS:
THE CONTRACTORS SHALL USE DIMENSIONS SHOWN ON THE DRAWINGS AND ACTUAL FIELD MEASUREMENT. NOTIFY THE AE PROJECT MANAGER IF ANY DISCREPANCIES ARE FOUND PRIOR TO PROCEEDING WITH WORK.
3. FIRESTOPPING SHALL BE PROVIDED PER G AND A SHEET REQUIREMENTS.
4. ALL CONDUIT, CABLE, PIPING, AND OTHER MECHANICAL / ELECTRICAL SYSTEMS NOT ASSOCIATED WITH THE PROJECT SHALL BE INSTALLED IN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS. ALL CONDUIT, CABLE, BATTERY, ETC.) SHALL BE ROUTED AROUND SUCH SPACES IN CORRIDORS OR UNDERSLAB AND NOT THROUGH THESE SPACES.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE SITE AND DETERMINE THE EXACT EXTENT OF WORK, COORDINATION, DEMOLITION, TEMPORARY CONSTRUCTION, TEMPORARY FACILITIES, UTILITIES, ETC. NECESSARY TO COMPLETE THIS PROJECT AS INDICATED IN THE CONTRACT DOCUMENTS.
6. ALL CONDUIT SHALL BE INSTALLED CONCEALED IN FINISHED AREA UNLESS NOTED OTHERWISE.
7. DO NOT ROUTE CONDUIT WITHIN STRUCTURAL OR TOPPING SLABS OF FLOORS UNLESS SPECIFICALLY NOTED OTHERWISE AND APPROVED BY STRUCTURAL ENGINEER.
8. DO NOT PAINT CONDUIT.
9. COORDINATE INSTALLATION OF WALL AND FLOOR DEVICES WITH ARCHITECTURAL ELEVATIONS AND FURNITURE PLANS AND/OR SPECIALTY EQUIPMENT SHOP DRAWINGS PRIOR TO ROUGH IN.
10. COORDINATE INSTALLATION OF ELECTRICAL DEVICES SERVING MECHANICAL EQUIPMENT WITH MECHANICAL WORK PRIOR TO ROUGH IN.
11. DISCONNECT LOCATIONS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS WITHIN LINE OF SITE TO EQUIPMENT THEY SERVE. MOUNT AT 6"-3" MAX. HEIGHT TO TOP OF ENCLOSURE.
12. ALL FLOOR MOUNTED EQUIPMENT SHALL BE MOUNTED ON A 4" HOUSE KEEPING PAD UNLESS NOTED OTHERWISE.
13. PROVIDE FUSES PER EQUIPMENT MANUFACTURER'S REQUIREMENTS.
14. SEE MECHANICAL EQUIPMENT SCHEDULE FOR CIRCUIT AND OVERCURRENT SIZES.
15. PROVIDE A GREEN INSULATED GROUNDING CONDUCTOR FOR ALL CIRCUITS.
16. PROVIDE PROTECTION ABOVE ALL NETWORK EQUIPMENT (INCLUDING BUT NOT LIMITED TO CABLEING, BUS, CABLE TRAY, EQUIPMENT BAYS, RECTIFIERS, BATTERIES, INVERTERS, DISTRIBUTION PANELS, ETC.) WHEN WORKING ABOVE EQUIPMENT. ALL PROTECTION SHALL BE COORDINATED WITH THE VERIZON SWITCH MANAGER TO ENSURE THAT THE PROTECTION WILL NOT BLOCK ACCESS TO EQUIPMENT OR CAUSE OVERHEATING. PROVIDE TEMPORARY COOLING AS REQUIRED.
17. PROVIDE ALL POWER CONNECTIONS FOR FIRE SMOKE DAMPERS INCLUDING CONNECTIONS BETWEEN FSD CONTROL RELAYS AND FSD'S.
18. EACH EXTERIOR AC POWER CIRCUIT MUST HAVE A SURGE SUPPRESSOR INSTALLED PER VERIZON STANDARDS.
19. PROVIDE 2-HOLE LONG BARREL COMPRESSION LUGS FOR ALL POWER AND GROUNDING CONNECTIONS TO A BUS OR WHERE FEASIBLE. USE MANUFACTURER'S COMPRESSION TOOL WITH PROPER DIE FOR EACH CONNECTOR. MANUFACTURER'S EMBOSSED CODING SYSTEM IS REQUIRED. A UNIVERSAL OR DIE-LESS TYPE CRIMPING TOOL SHALL NOT BE USED. PROVIDE LUGS WITH INSPECTION HOLE FOR ALL INTERIOR INSTALLATIONS. PROVIDE CLOSED LUGS (NO INSPECTION HOLE) FOR EXTERIOR OR UNDERGROUND CONNECTIONS.
20. ALL RECESSED PANELS MOUNTED IN FIRE RATED WALLS SHALL BE OF FIRE RATED CONSTRUCTION TO MATCH RATING OF WALL. (i.e. TRAP PRIMERS, F.E. CABINETS, etc.)

SHEET INDEX:

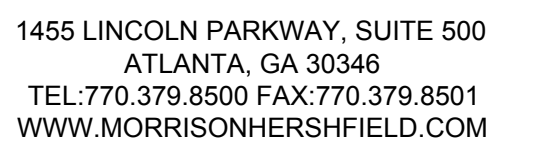
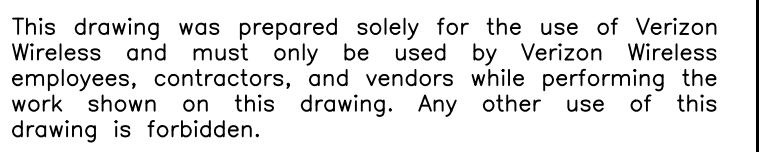
NO.	SHEET	TITLE
1	TS001	TITLE SHEET
2	TS002	GENERAL NOTES
3	TS003	ELECTRICAL SCHEDULE
4	TS004	MECHANICAL SCHEDULE
5	TS005	PLUMBING SCHEDULE
6	TS006	HVAC SCHEDULE
7	TS007	TELECOMMUNICATIONS SCHEDULE
8	TS008	FINISHES SCHEDULE
9	TS009	PAINT SCHEDULE
10	TS010	MECHANICAL EQUIPMENT SCHEDULE
11	TS011	ELECTRICAL EQUIPMENT SCHEDULE
12	TS012	TELECOMMUNICATIONS EQUIPMENT SCHEDULE
13	TS013	FINISHES SCHEDULE
14	TS014	PAINT SCHEDULE
15	TS015	MECHANICAL EQUIPMENT SCHEDULE
16	TS016	ELECTRICAL EQUIPMENT SCHEDULE
17	TS017	TELECOMMUNICATIONS EQUIPMENT SCHEDULE
18	TS018	FINISHES SCHEDULE
19	TS019	PAINT SCHEDULE
20	TS020	MECHANICAL EQUIPMENT SCHEDULE
21	TS021	ELECTRICAL EQUIPMENT SCHEDULE
22	TS022	TELECOMMUNICATIONS EQUIPMENT SCHEDULE
23	TS023	FINISHES SCHEDULE
24	TS024	PAINT SCHEDULE
25	TS025	MECHANICAL EQUIPMENT SCHEDULE
26	TS026	ELECTRICAL EQUIPMENT SCHEDULE
27	TS027	TELECOMMUNICATIONS EQUIPMENT SCHEDULE
28	TS028	FINISHES SCHEDULE
29	TS029	PAINT SCHEDULE
30	TS030	MECHANICAL EQUIPMENT SCHEDULE
31	TS031	ELECTRICAL EQUIPMENT SCHEDULE
32	TS032	TELECOMMUNICATIONS EQUIPMENT SCHEDULE
33	TS033	FINISHES SCHEDULE
34	TS034	PAINT SCHEDULE
35	TS035	MECHANICAL EQUIPMENT SCHEDULE
36	TS036	ELECTRICAL EQUIPMENT SCHEDULE
37	TS037	TELECOMMUNICATIONS EQUIPMENT SCHEDULE
38	TS038	FINISHES SCHEDULE
39	TS039	PAINT SCHEDULE
40	TS040	MECHANICAL EQUIPMENT SCHEDULE
41	TS041	ELECTRICAL EQUIPMENT SCHEDULE
42	TS042	TELECOMMUNICATIONS EQUIPMENT SCHEDULE
43	TS043	FINISHES SCHEDULE
44	TS044	PAINT SCHEDULE
45	TS045	MECHANICAL EQUIPMENT SCHEDULE
46	TS046	ELECTRICAL EQUIPMENT SCHEDULE
47	TS047	TELECOMMUNICATIONS EQUIPMENT SCHEDULE
48	TS048	FINISHES SCHEDULE
49	TS049	PAINT SCHEDULE
50	TS050	MECHANICAL EQUIPMENT SCHEDULE
51	TS051	ELECTRICAL EQUIPMENT SCHEDULE
52	TS052	TELECOMMUNICATIONS EQUIPMENT SCHEDULE

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<div>verizon</div> <div>WESTBOROUGH MEC PHASE 2</div> <div>400 FRIBERG PARKWAY WESTBOROUGH, MA 01581</div>		
A REV	DESCRIPTION	DATE
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NETWORK COMPLIANCE SUBMITTALS		DATE
ISSUED FOR EOS REVIEW		03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION		03.27.2020
REISSUED FOR CONSTRUCTION		04.16.2020
ISSUED FOR BUILDING PERMIT		05.29.2020
PROJECT NO:		200132400
CAD DWG FILE:	200132400	STAMP
DESIGNED BY:	BK	<div>COMMONWEALTH OF MASSACHUSETTS BABLU KAPOOR Professional Engineer No. 55553 05-29-2020</div>
DRAWN BY:	MSL	
CHECKED BY:	BK	
COPYRIGHT:	MARCH 2015	
SHEET TITLE		
ELECTRICAL GENERAL NOTES, ABBREVIATIONS AND LEGEND		
SHEET NUMBER		
E001		



KEY PLAN

A. REFER TO SHEET E001 FOR ABBREVIATIONS, SYMBOLS, AND GENERAL NOTES.



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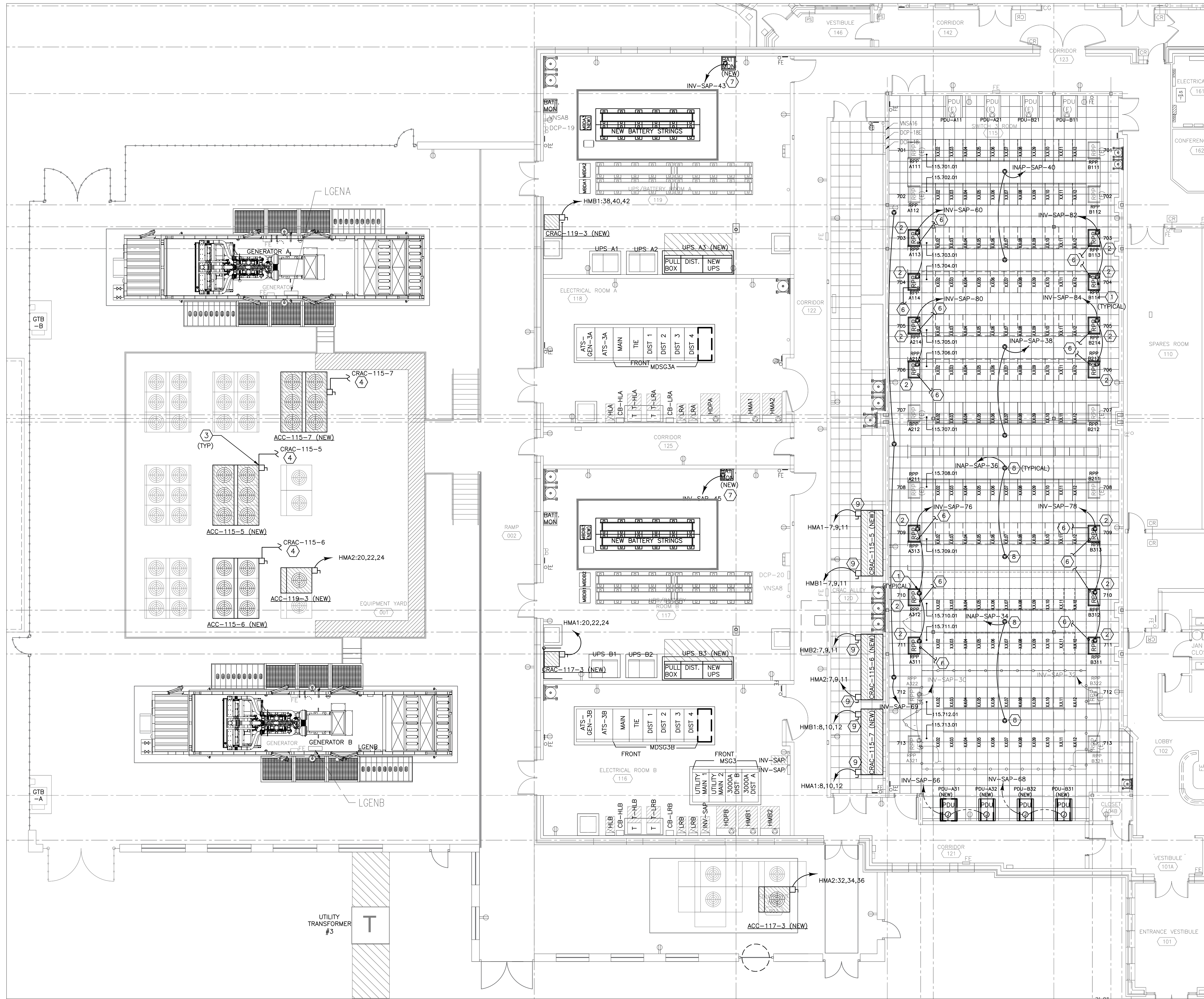
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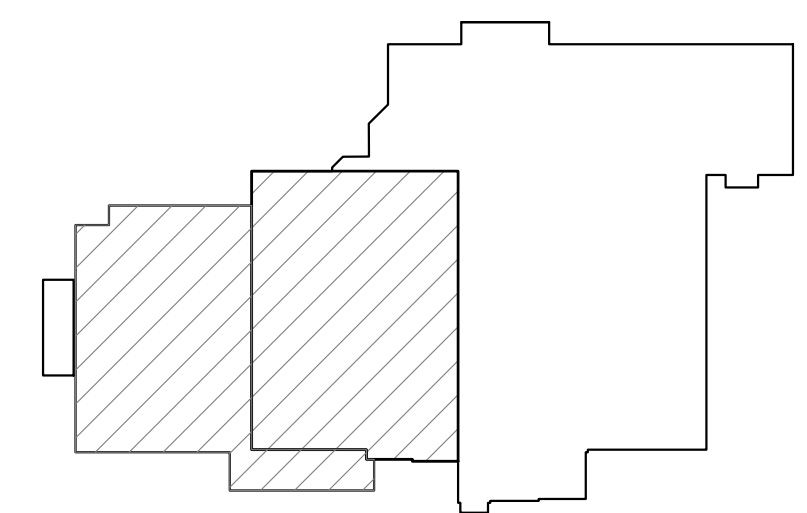
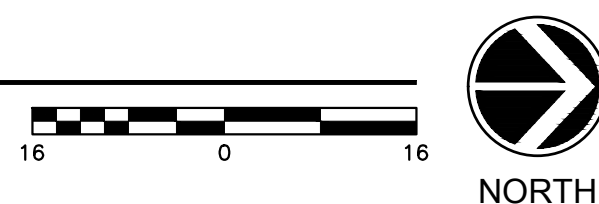
SHEET TITLE

OVERALL POWER
FLOOR PLAN

SHEET NUMBER **E110**



1 OVERALL POWER FLOOR PLAN



KEY PLAN

GENERAL NOTES

- A. PROVIDE FIRE SEAL FOR ALL CONDUITS PENETRATING FIRE RATED WALL PER ARCHITECTURAL DRAWINGS. ALL CONDUITS IN FINISHED AREA SHALL BE CONCEALED UNLESS NOTED OTHERWISE.
- B. COORDINATE EXACT LOCATION OF PANELS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH IN.
- C. PROVIDE WIREWAY TRANSITION SECTIONS AT INTERSECTIONS WITH GED RACK. TRANSITION SECTIONS SHALL ALLOW CABLEING TO EXTEND FROM WIREWAY AT APPROX. 12 FEET TO CABLE RACKING AT APPROX. 10' - 6".
- D. ALL CONDUIT, CABLE, PIPING AND OTHER ASSOCIATED ELECTRICAL/MECHANICAL SYSTEMS NOT ASSOCIATED WITH TELECOMMUNICATION AREA ROOMS SHALL BE ROUTED AROUND SWITCH ROOMS, BATTERY ROOMS, TELCO, SECURITY ACCESS CONTROL AND CONTROL ROOMS.)
- E. REFER TO SHEET E01 FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS.
- F. ALL PANELBOARDS SERVING EXTERIOR CIRCUITS SHALL BE PROTECTED BY TVSS - SEE PANEL SCHEDULES.
- G. REFER TO SHEET E01 FOR MECHANICAL EQUIPMENT SCHEDULE FOR POWER REQUIREMENTS TO EQUIPMENT SHOWN.
- H. REFER TO SHEET E401 FOR ENLARGED ELECTRICAL ROOM PLANS.

KEY NOTES

- ① INVERTER POWER FOR TRENDPOINT METER IN THE RPP.
- ② NEW RPP. SEE DRAWING E402 FOR UNDERLOOR RECEPTACLE REQUIREMENTS.
- ③ FACTORY MOUNTED AIR-CONDITIONING CONDENSERS (ACC'S) DISCONNECTS.
- ④ CONTRACTOR TO PROVIDE NEW FEEDER USING EXISTING CONDUIT FROM NEW CONDUCTORS TO/FROM INDOOR COMPUTER ROOM AIR-CONDITIONING (CRAC) UNIT TO ITS ASSOCIATED OUTDOOR AIR-CONDITIONING CONDENSER (ACC) UNIT LOCATED OUTSIDE. BRANCH CIRCUITS FROM INDOOR ACC UNIT SHALL BE CONNECTED TO CRAC UNIT'S INTERIOR FUSE. CONDUIT INSTALLED IN ORIGINAL SAP BUILT OUT. CONTRACTOR TO FIELD COORDINATE EXISTING CONDUIT STUB UP LOCATION AND EXTEND/MODIFY AS NEEDED.
- ⑤ ELECTRICAL CONTRACTOR TO UTILIZE EXISTING POWER CONNECTION FOR NEW PMP. FIELD COORDINATE EXACT REQUIREMENTS WITH NEW FDU.
- ⑥ PROVIDE 1-3/4" CONDUIT WITH PULL STRING FROM RPP INTO NEW TRENCH. TO BE USED AS DIRECTED BY OWNER. FIELD COORDINATE LOCATION.
- ⑦ PROVIDE NEW RACK MOUNTED/WALL MOUNTED NOT ACCEPTABLE) ALBERT BATTERY-MOUNTING SYSTEM AS PER SPECIFICATION SECTION 28.00. BATTERY-MOUNTING SYSTEM ONLY FOR NEW BATTERY AND LEAVE EXISTING SYSTEM ALONE.
- ⑧ POWER CONNECTION FOR SUB-ZERO POLAR CAP ROOF. COORDINATE MECHANICAL DRAWING AND CONTRACTOR FOR EXACT REQUIREMENTS.
- ⑨ PROVIDE NEW FEEDER USING EXISTING CONDUIT INSTALLED UNDER SAP PROJECT. CONTRACTOR TO FIELD COORDINATE EXISTING CONDUIT STUB UP LOCATION AND EXTEND/MODIFY AS NEEDED.

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△ REV	DESCRIPTION	DATE
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△	BULLETIN 1	04/16/20
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NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
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REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

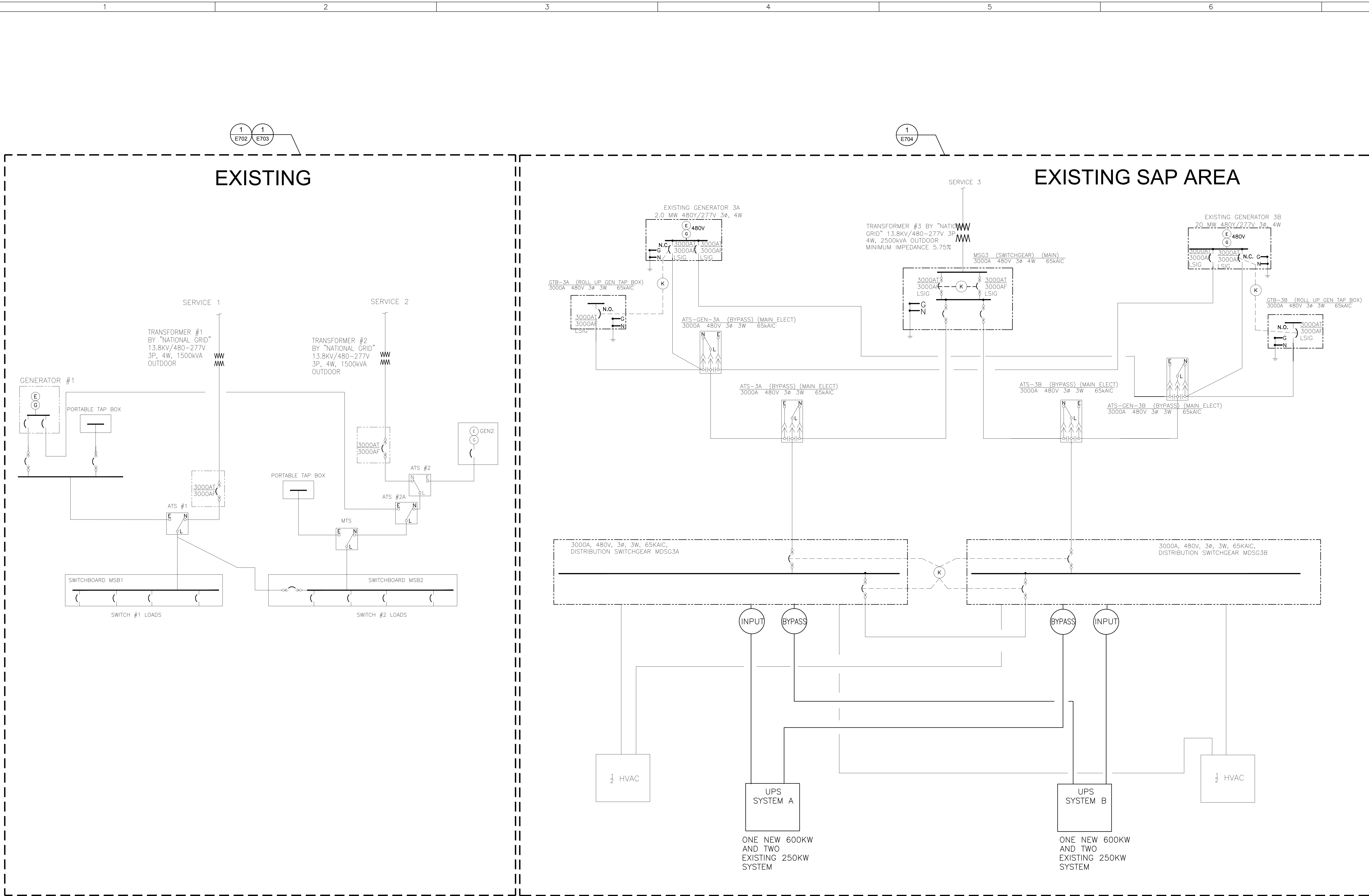
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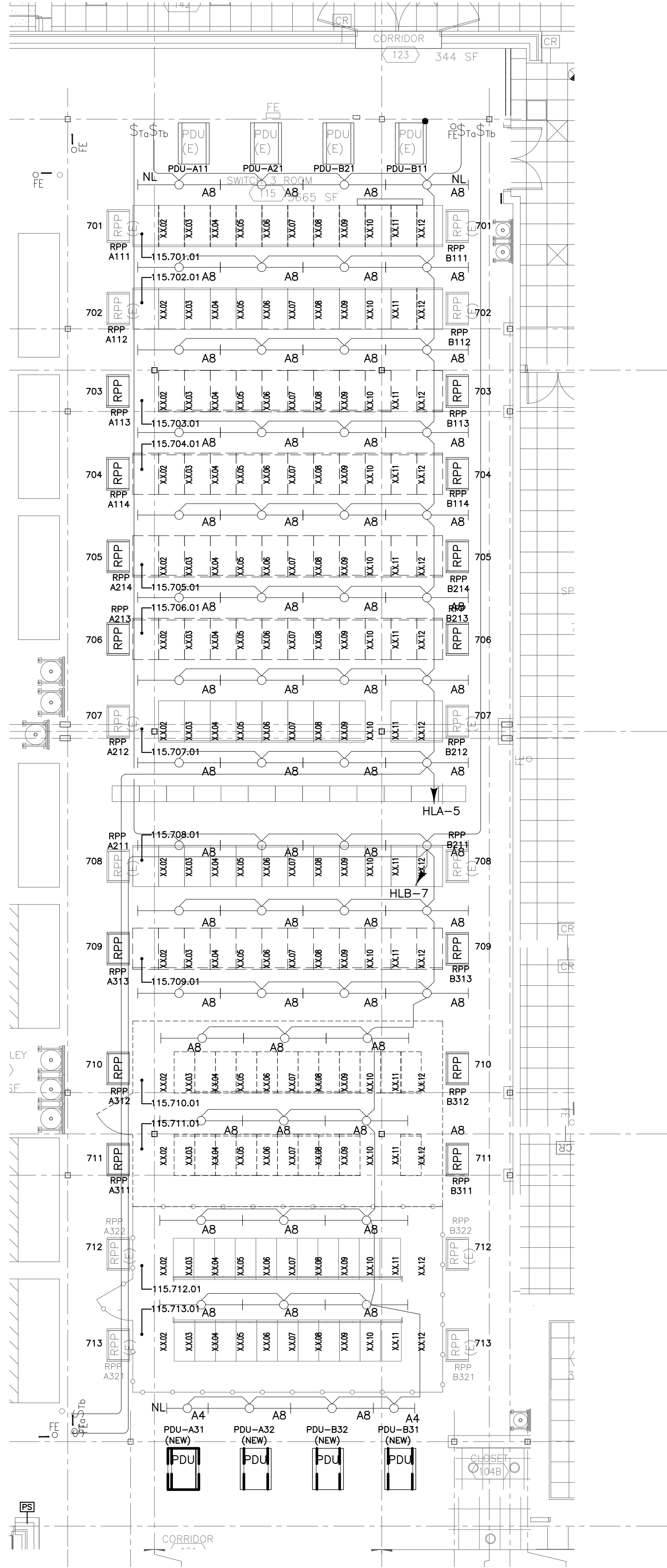
OVERALL POWER FLOOR PLAN

SHEET NUMBER

E111



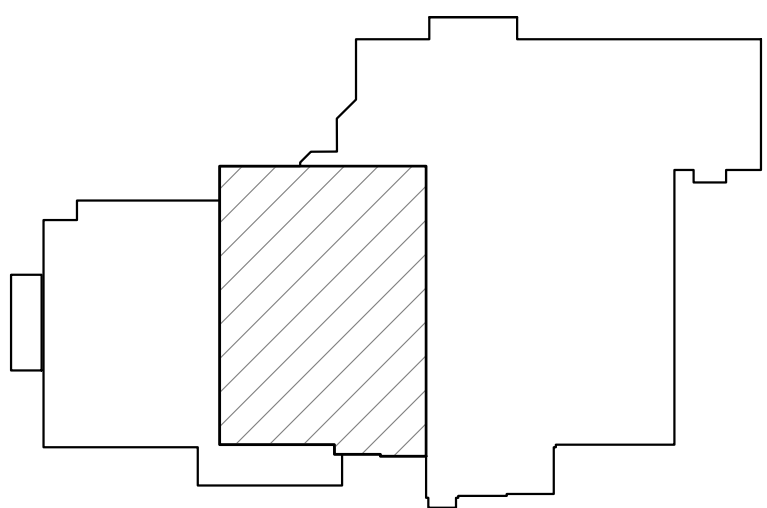
1 ELECTRICAL OVERALL ONE-LINE DIAGRAM-CONCEPTUAL
E701 SCALE : NTS



GENERAL NOTES:

- A. ALL THE LUMINAIRES DESIGNATED 'NL' ARE NIGHT LIGHTS. ALL NIGHT LIGHTS SHALL BE UNSWITCHED AND REMAIN ON ALL THE TIMES.
- B. ALL EXIT LUMINAIRES SHALL BE UNSWITCHED.
- C. UPPER CASE ALPHA CHARACTER INSIDE/ADJACENT TO LUMINAIRES INDICATES LUMINAIRE TYPE.
- D. LOWER CASE ALPHA CHARACTER INSIDE/ADJACENT TO LUMINAIRE INDICATES ASSOCIATED SWITCH CONTROLLING LIGHTING BRANCH CIRCUIT.
- E. REFER TO DRAWING E602 FOR LIGHTING FIXTURE SCHEDULE.
- F. PROVIDE UNSWITCHED HOT LEAD FOR ALL EMERGENCY TYPE 'EM' LIGHTS.
- G. ALL EXTERIOR CIRCUITS SHALL BE MINIMUM #10 CONDUCTORS. CONTRACTOR SHALL UPSIZE AS NEEDED TO ENSURE VOLTAGE DROP IS 3% OR LESS.
- I. ALL EMERGENCY LIGHTS, EXIST SIGNS AND NIGHT LIGHTS SHALL BE CIRCUITED WITH AN UNSWITCHED "HOT" CONDUCTOR.

ALL TASK LIGHTING ARE EXISTING.
CONTRACTOR TO FIELD COORDINATE TASK
LIGHT LOCATIONS AND RELOCATE AS NEEDED
TO ENSURE NO LIGHTS ARE ABOVE THE
CABINETS.



KEY PLAN



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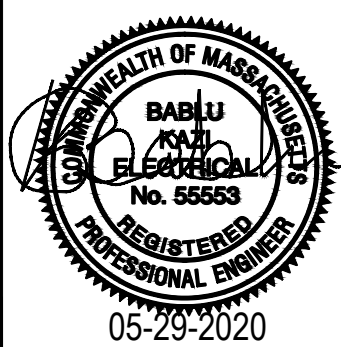
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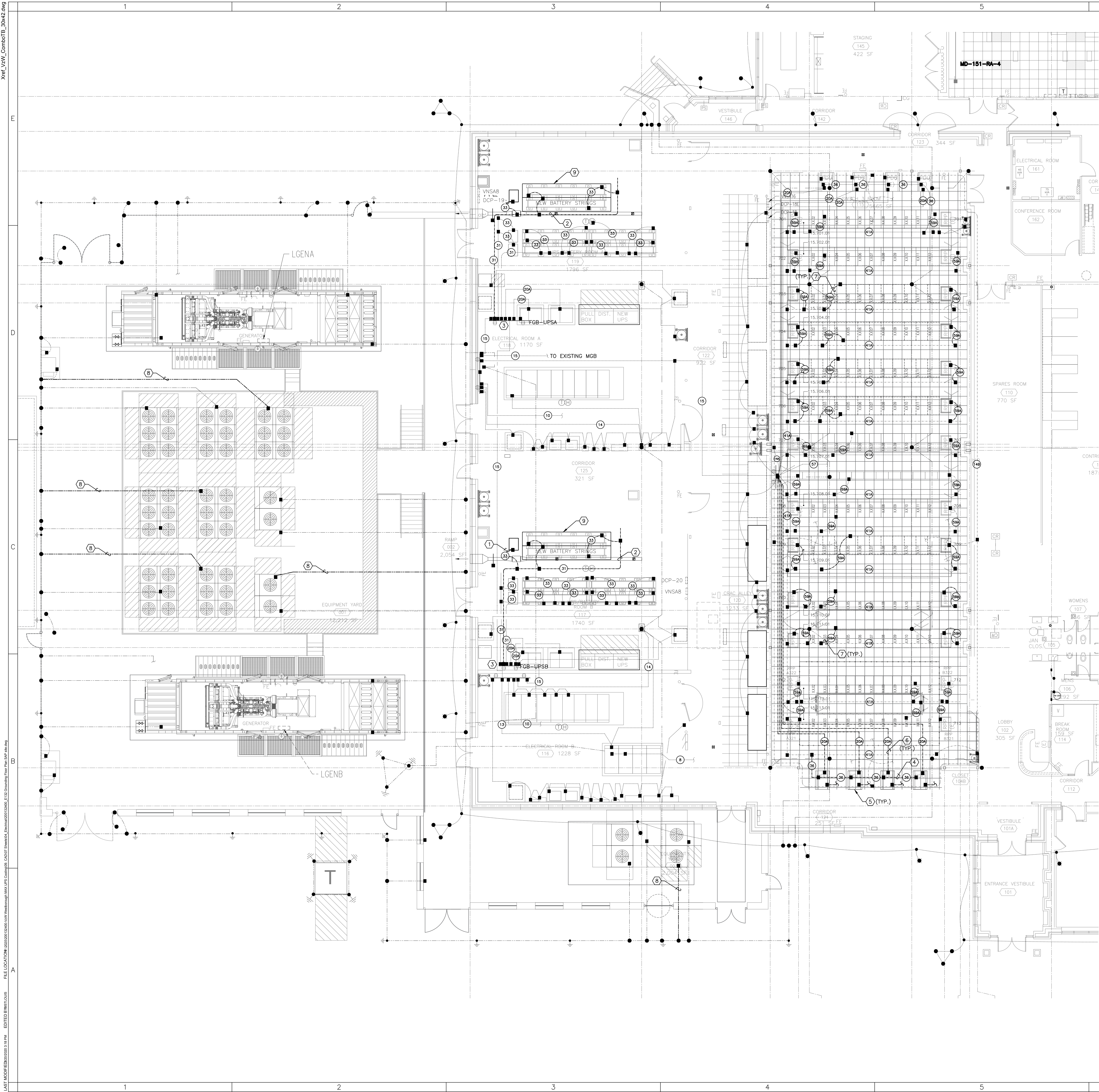


SHEET TITLE
LIGHTING
FLOOR PLAN

SHEET NUMBER
E121

Xref: \\VH_CombotE_30x42.dwg

LAST MODIFIED: 03/20/2020 1:18 PM EDITED: BWH/10/015 FILE LOCATION: \\00300015040\\VH_Westborough_MA\\UPS_Coverage CAD: \\00300015040\\VH_Westborough_MA\\UPS_Coverage E132 Grounding Floor Plan.dwg

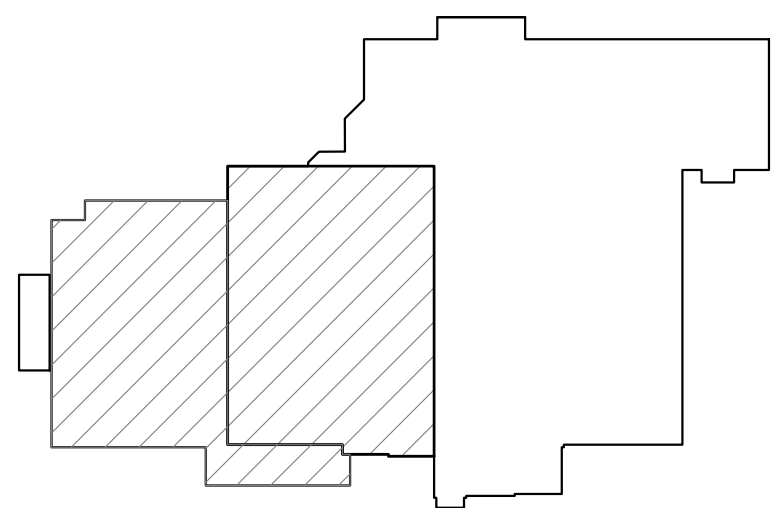


GENERAL NOTES:

- REFER TO SHEET E001 FOR ABBREVIATIONS, SYMBOLS, AND GENERAL NOTES.
- PRIOR TO BID, THE CONTRACTOR SHALL COORDINATE WITH VERIZON WIRELESS ALL GROUNDING TO BE INSTALLED UNDER THIS CONTRACT AND IDENTIFY GROUNDING TO BE INSTALLED BY OTHERS (DC PLANT INSTALLER).
- REFER TO GROUNDING ONE LINE DIAGRAM DRAWING E800 FOR ADDITIONAL GROUNDING REQUIREMENTS, LEAD SCHEDULE, AND ADDITIONAL ALL GROUNDING CONDUCTOR REQUIREMENTS.
- ALL GROUNDING CONNECTION SHALL BE DONE PER NSTD 33, NSTD 119, NSTD 34, NSTD 35 REQUIREMENTS.
- GROUND CONNECTION SYMBOLS REPRESENT TYPE OF CONNECTION AND NOT NECESSARILY QUANTITY OR EXACT LOCATION OF CONNECTIONS.
- ROUTING OF GROUND CONDUCTORS AND LOCATIONS OF GROUND BARS SHOWN IS SCHEMATIC IN NATURE ONLY. FIELD VERIFY EXACT ROUTING AND LOCATIONS OF ALL GROUND BARS.
- ALL WALL PENETRATION FOR GROUNDING CONNECTION SHALL COMPLY WITH REQUIREMENTS IN DIVISION 07 SECTION "PENETRATION FIRE-STOPPING."
- PROVIDE BRASS TAGS "DO NOT DISCONNECT" AT EACH TERMINATION. PROVIDE DURABLE TAG INDICATING DESIGNATION OR LOCATION AT OTHER END.
- PROVIDE 12-INCH MINIMUM RADIUS BENDS FOR ALL GROUND CABLES
- EXACT ROUTING OF ALL GROUNDING CABLES AND CONDUITS SHALL BE SUBMITTED IN SCALED FLOOR PLANS IN AUTOCAD SHOP DRAWINGS PRIOR TO INSTALLATION.

KEYNOTES:

- LEAD 33. BOND BATTERY RACK TO LEAD 31 GROUNDING CONDUCTOR. LEAD 33 TO BE INSTALLED BY DC VENDOR.
- LEAD 31. BOND BATTERY RACKS, FRAMES, SWITCHBOARDS, PANELBOARDS AND ANY OTHER METAL ENCLOSURE TO THE MASTER GROUND BAR.
- EXISTING MASTER GROUND BAR. VERIFY IN FIELD.
- LEAD 36. BOND PDU FRAME TO LEAD 41A.
- BOND PDU, PANEL BOARD, AND OTHER METALLIC ENCLOSURES TO FLOOR GROUND BAR BY USING #6 GREEN INSULATED COPPER CONDUCTOR.
- LEAD 20A. BOND PDU TRANSFORMER NEUTRAL TO FLOOR GROUND (FGB) BAR BY USING #2/0 COPPER GROUND CONDUCTOR.
- LEAD 58A. BOND EACH EQUIPMENT IT-CABINET AND RPP TO LEAD 41A GROUNDING CONDUCTOR.
- BOND ALL OUTDOOR HVAC UNIT FRAMES, GENERATOR TERMINATION CABINET, DISCONNECT SWITCH FRAME, METALLIC PIPES, METALLIC EXTERIOR DOOR FRAME, OTHER METALLIC FRAMES, HANDRAILS, EXTERIOR LIGHT FIXTURE, AND METALLIC FRAME TO NEW BURIED GROUND CONDUCTOR RING LEAD #1 WITH SOLID BARE TINNED COPPER #2 CONDUCTOR. PROVIDE MECHANICAL CONNECTION AT HVAC UNITS. FUEL POLISHER, DISCONNECT SWITCH AND METALLIC ENCLOSURES AND EXOTHERMIC WELD TO NEW BURIED GROUND CONDUCTOR RING LEAD #1.
- REFER TO DETAIL 1/501 FOR ADDITIONAL INFORMATION.



KEY PLAN



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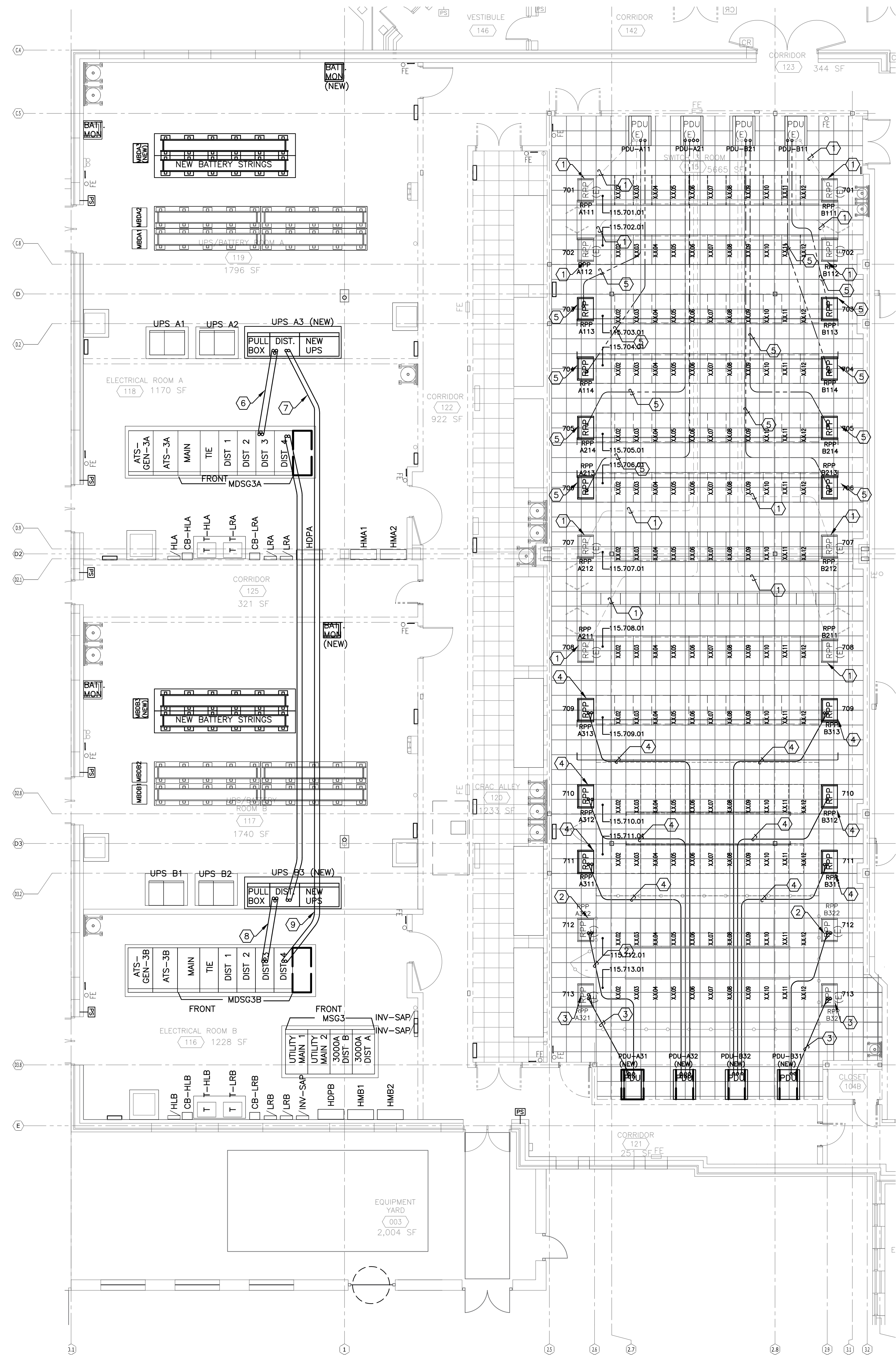
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NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
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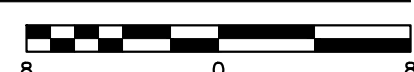


SHEET TITLE	GROUNDING FLOOR PLAN
SHEET NUMBER	E132



UNDER SLAB CONDUIT ROUTING PLAN-RAISED FLOOR

SCALE: 1/8" = 1'-0"



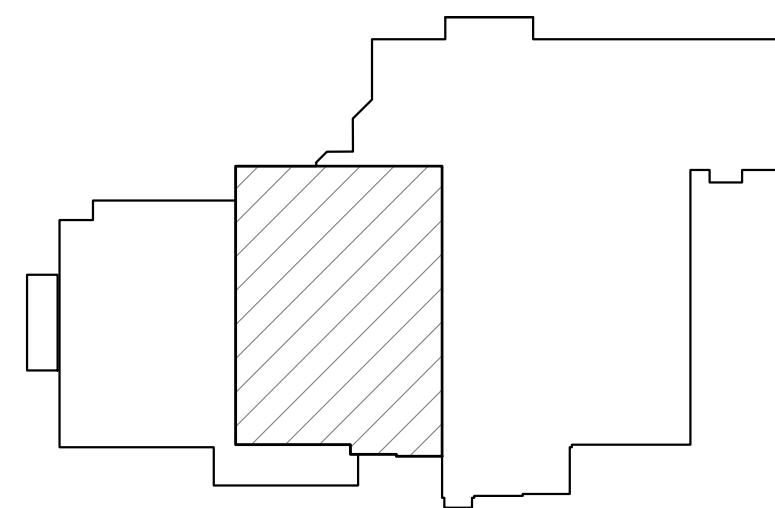
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GENERAL NOTES:

- A. REFER TO SHEET E001 FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS.
- B. REFER TO SHEET E701-707 FOR SIZES OF FEEDERS AND MORE INFORMATION.
- C. CONDUIT ROUTING IS SCHEMATICALLY SHOWN. CONTRACTOR SHALL SUBMIT COORDINATION DRAWINGS WITH PROPOSED ROUTING FOR REVIEW AND APPROVAL BY CONSULTANT PRIOR TO INSTALLATION.
- D. ALL CONDUITS 2" OR LARGER COMMUNICATING BETWEEN SPACES WITH FIRE RATED PARTITIONS SHALL HAVE BOTH ENDS OF THE CONDUIT SEALED WITH A DUCT SEAL MATERIAL LISTED FOR USE WITH THE WIRE INSULATION MATERIAL TO PREVENT POTENTIAL SMOKE OR MOISTURE MIGRATION INTO THE SPACE.
- E. ALL CONDUITS PENETRATING THRU FIRE RATED PARTITION TO BE SEALED WITH FIRE STOPPING MATERIAL. REFER TO ARCHITECTURAL DRAWING FOR FIRE STOPPING EQUIPMENTS.
- F. ALL PLANS ARE DIAGRAMMATIC IN NATURE AND ALL EXPOSED CONDUITS SHALL BE RUN AT 90 DEGREE ANGLES.
- G. ALL CONDUIT SHALL BE INSTALLED DAY ONE. PROVIDE PULL STRING IN ALL FUTURE CONDUITS AND CLEARLY LABEL ALL FUTURE CONDUITS.

KEY NOTES:

- (1) EXISTING REMOTE POWER PANEL (RPP) AND FEEDER TO REMAIN. MAINTAIN POWER CONNECTION.
- (2) EXISTING RPP INSTALLED UNDER PHASE 1 WITH TEMPORARY FEEDER. ELECTRICAL CONTRACTOR TO DISCONNECT AND REMOVED EXISTING TEMPORARY FEEDER. RUN NEW FEEDER USING EMT CONDUIT INSIDE THE RAISED FLOOR AND RECONNECT. RUN CONDUIT TIGHT TO THE FLOOR AS MUCH AS POSSIBLE. REFER TO DRAWING E704 FOR EXACT REQUIREMENTS.
- (3) EXISTING RPP INSTALLED UNDER PHASE 1 WITH NO FEEDER. ELECTRICAL CONTRACTOR RUN NEW FEEDER USING EMT CONDUIT INSIDE THE RAISED FLOOR AND CONNECT. RUN CONDUIT TIGHT TO THE FLOOR AS MUCH AS POSSIBLE. REFER TO DRAWING E704 FOR EXACT REQUIREMENTS.
- (4) NEW RPP INSTALLED UNDER THIS CONTACT. ELECTRICAL CONTRACTOR RUN NEW FEEDER USING EMT CONDUIT INSIDE THE RAISED FLOOR AND CONNECT. RUN CONDUIT TIGHT TO THE FLOOR AS MUCH AS POSSIBLE. REFER TO DRAWING E704 FOR EXACT REQUIREMENTS.
- (5) NEW RPP INSTALLED UNDER THIS CONTACT. ELECTRICAL CONTRACTOR PROVIDE NEW FEEDER USING EXISTING UNDER GROUND CONDUIT. REFER TO DRAWING E704 FOR EXACT REQUIREMENTS.
- (6) NEW OVERHEAD UPS 3A INPUT FEEDER FROM SWITCHGEAR MDSB3A. FIELD COORDINATE ROUTING AND TERMINATION SECTION IN SWITCHGEAR MDSG3A. REFER TO DRAWING E704 FOR FEEDER REQUIREMENTS.
- (7) NEW OVERHEAD UPS 3A BYPASS FEEDER FROM SWITCHGEAR MDSB3B. FIELD COORDINATE ROUTING AND TERMINATION SECTION IN SWITCHGEAR MDSG3B. REFER TO DRAWING E704 FOR FEEDER REQUIREMENTS.
- (8) NEW OVERHEAD UPS 3B INPUT FEEDER FROM SWITCHGEAR MDSB3B. FIELD COORDINATE ROUTING AND TERMINATION SECTION IN SWITCHGEAR MDSG3B. REFER TO DRAWING E704 FOR FEEDER REQUIREMENTS.
- (9) NEW OVERHEAD UPS 3B BYPASS FEEDER FROM SWITCHGEAR MDSB3A. FIELD COORDINATE ROUTING AND TERMINATION SECTION IN SWITCHGEAR MDSG3A. REFER TO DRAWING E704 FOR FEEDER REQUIREMENTS.



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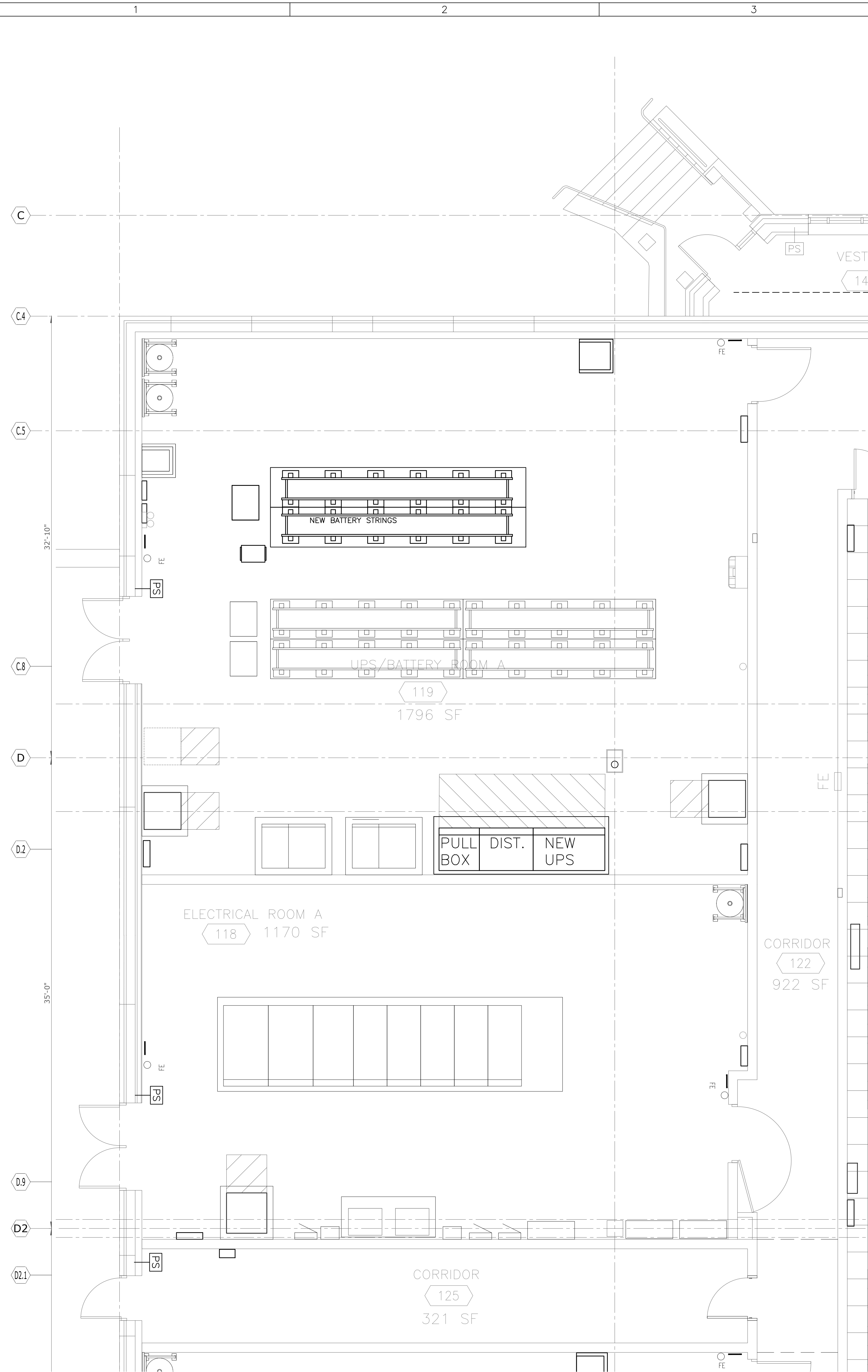
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SHEET TITLE

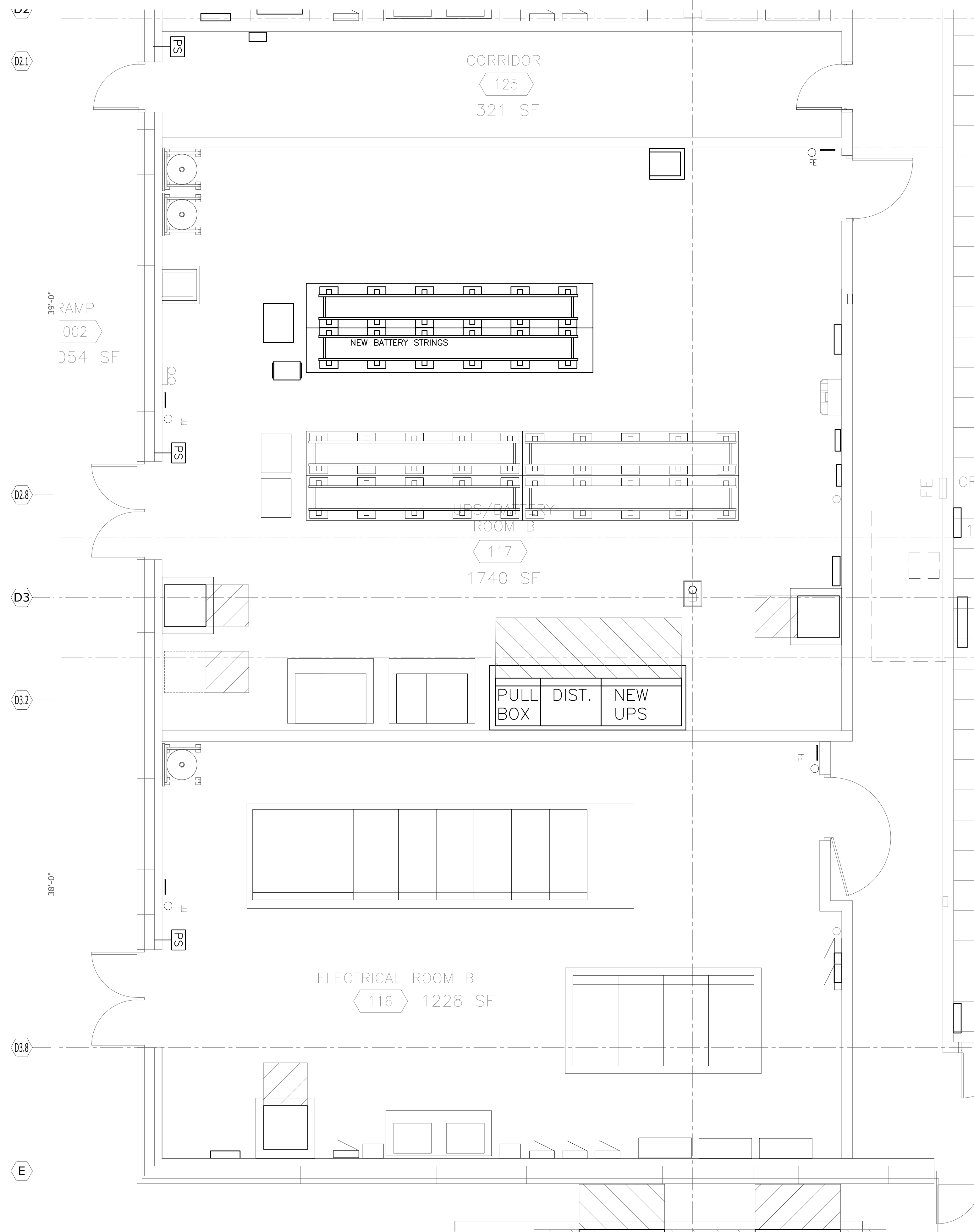
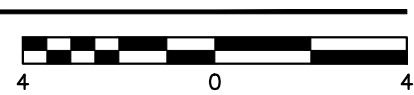
CONDUIT ROUTING PLAN RAISED FLOOR

SHEET NUMBER

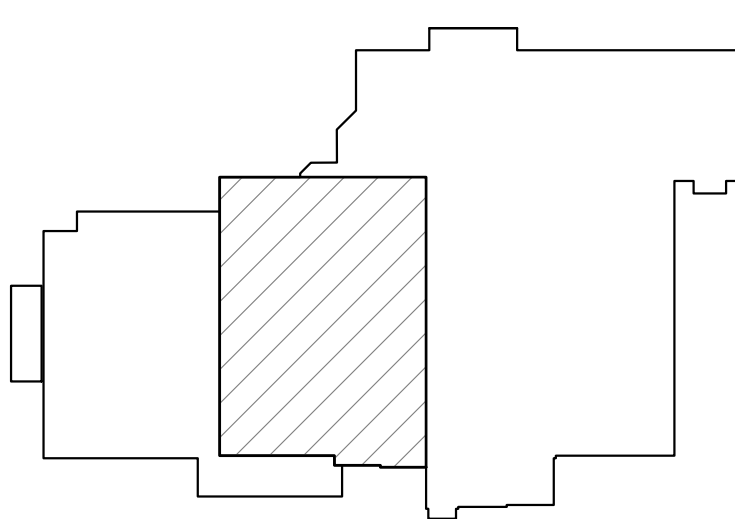
E301



1 ENLARGED ELECTRICAL 'A'
E401 SCALE: 1/4" = 1'-0"



2 ENLARGED ELECTRICAL 'B'



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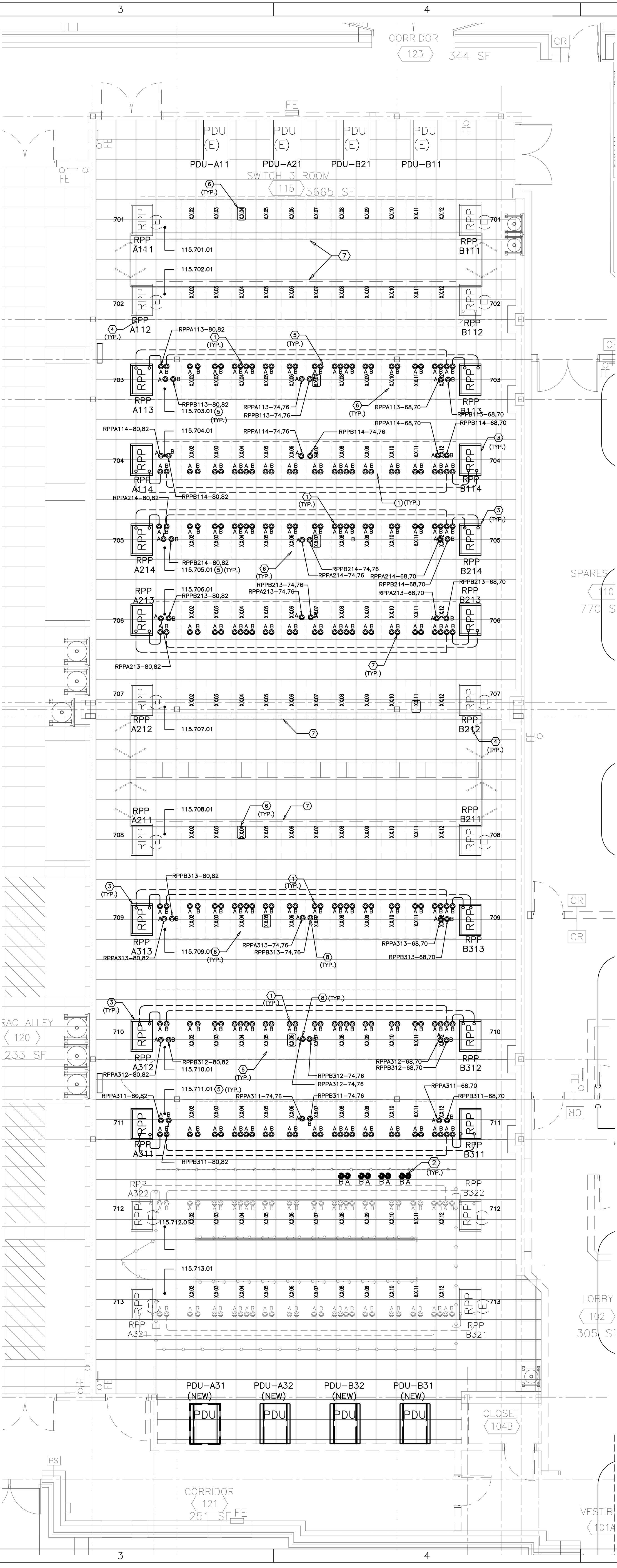
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ENLARGED
POWER PLANS

SHEET NUMBER

E401

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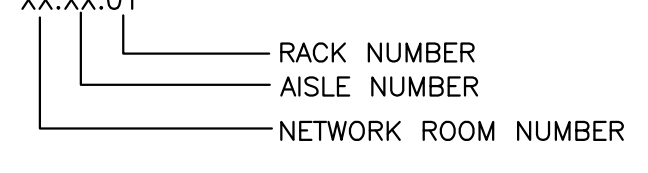
GENERAL NOTES

- A. PROVIDE FIRE SEAL FOR ALL CONDUITS PENETRATING FIRE RATED WALL PER ARCHITECTURAL DRAWINGS. ALL CONDUITS IN FINISHED AREA SHALL BE CONCEALED UNLESS NOTED OTHERWISE.
- B. COORDINATE EXACT LOCATION OF PANELS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH IN.
- C. PROVIDE WIREWAY TRANSITION SECTIONS AT INTERSECTIONS WITH CABLE RACK. TRANSITION SECTION SHALL ALLOW CABLING TO EXTEND FROM WIREWAY AT APPROX. 12 FEET TO CABLE RACKING AT APPROX. 10'-6".
- D. ALL CONDUIT, CABLE, PIPING AND OTHER ASSOCIATED ELECTRICAL/MECHANICAL SYSTEMS NOT ASSOCIATED WITH TELECOMMUNICATION AREA ROOMS SHALL BE ROUTED AROUND SUCH SPACES IN CORRIDORS OR UNDER SLAB. (TYPICAL FOR SWITCH ROOMS, BATTERY ROOMS, TELCO, SECURITY ACCESS CONTROL AND CONTROL ROOMS.)

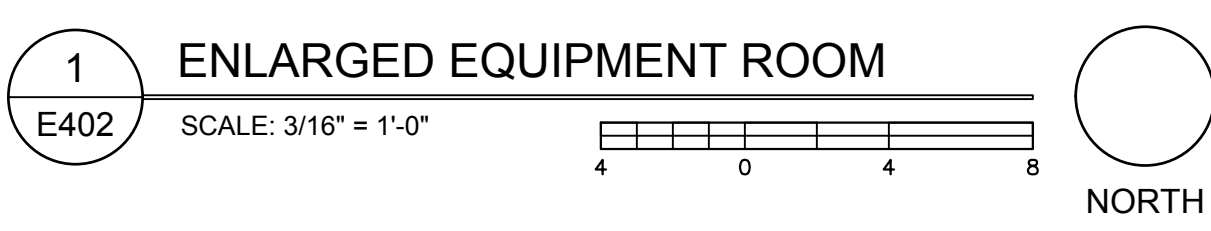
KEY NOTES

- 1 HUBBELL CS8369 RECEPTACLE WITH HUBBELL HBL7774WD RECEPTACLE WITH HBL7774WD COVER. SEE DETAIL 4/502.
- 2 AFTER COMPLETION OF THE PROJECT, ELECTRICAL CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING TEMPORARY RECEPTACLES. ALL WIRING SHALL BE REMOVED BACK TO SOURCE AND MADE SPARES.
- 3 SEE PANEL SCHEDULES FOR CIRCUITING INFORMATION.
- 4 'RPP' TO BE LABELED AS INDICATED. ELECTRICAL CONTRACTOR TO PROVIDE NEW TAG AND RE-LABEL IN THE FIELD. OLD LABEL TO ALSO REMAIN FOR CIRCUITING PURPOSES.
- 5 EACH CABINET LOCATION WITH AN INSTALLED RPP SHALL BE PROVIDED WITH A P-TOUCH LABEL (3/4" NOMINAL) WITH THE CABINET ID. CONTRACTOR TO COORDINATE NUMBERING SCHEME WITH VZW IMPLEMENTATION ON THE COLD AISLE SIDE TO PRE-IDENTIFY THE ENTIRE SPACE.
- 6 REFER TO NOMENCLATURE, THIS DRAWING.
- 7 ALL EXISTING CABINET UNDERFLOOR RECEPTACLES ARE TO REMAIN. MAINTAIN POWER CONTINUITY.
- 8 OBM/MCMT POWER (208V, SINGLE PHASE). INSTALL THREE SETS OF RED QUAD AND THREE OF BLUE QUAD 16-15R RECEPTACLES IN THE OVERHEAD RACK ABOVE THE CABINET.

NOMENCLATURE:



LABELING NOTE:
PROVIDE EXISTING AND NEW EACH UPS, PDU, AND RPP SHALL BE TAGGED WITH VINYL LETTERING AT LEAST 6" TALL WITH THE EQUIPMENTS ID (E.G. RPP B111) VINYL LETTERING SHALL BE RED IN COLOR WHILE "BT" TAGS SHALL BE BLUE. LETTERING SHALL USE AN ARIAL BOLD FONT OR SIMILAR.



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SHEET TITLE	ENLARGED EQUIPMENT ROOM
SHEET NUMBER	E402

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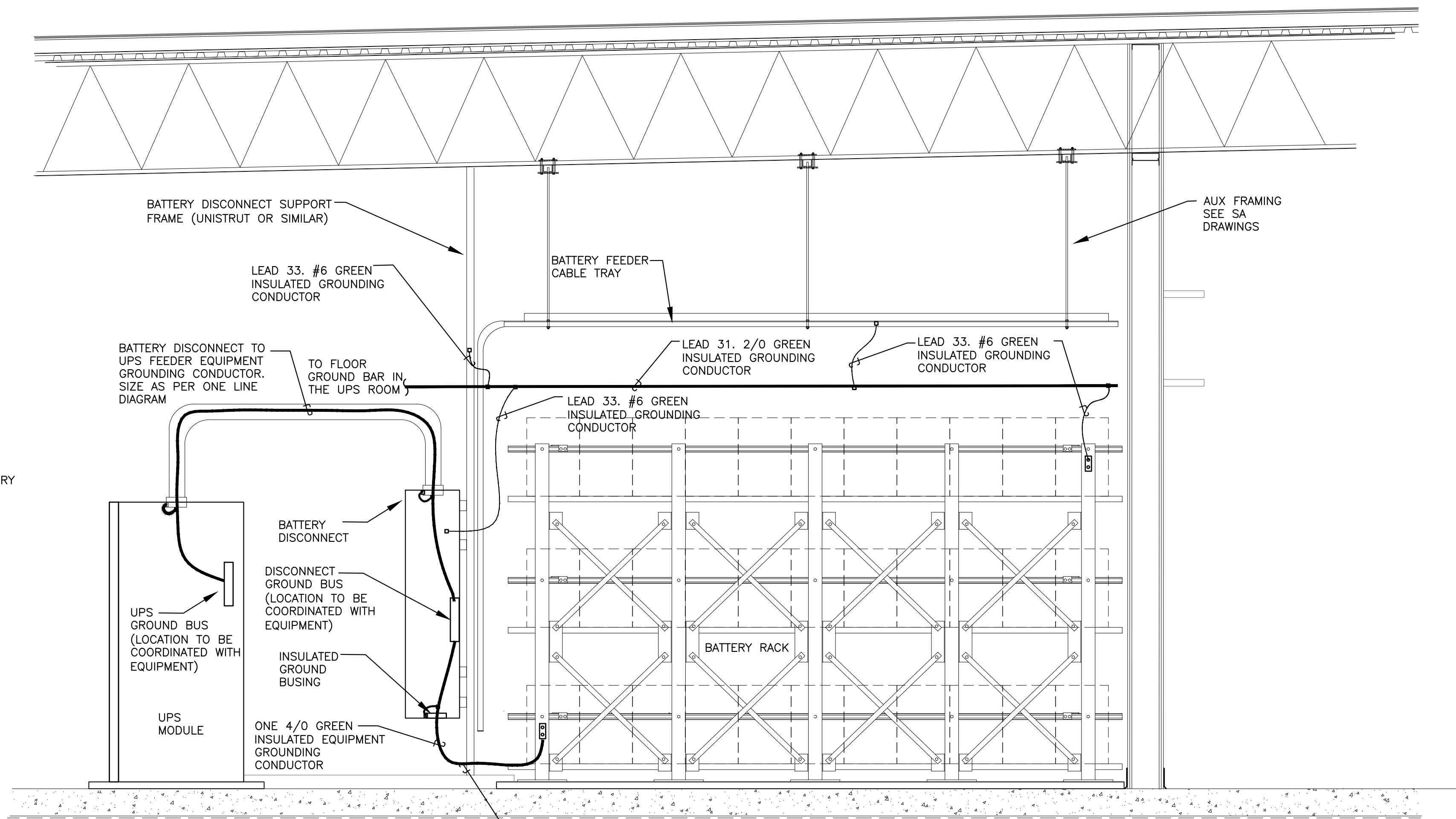
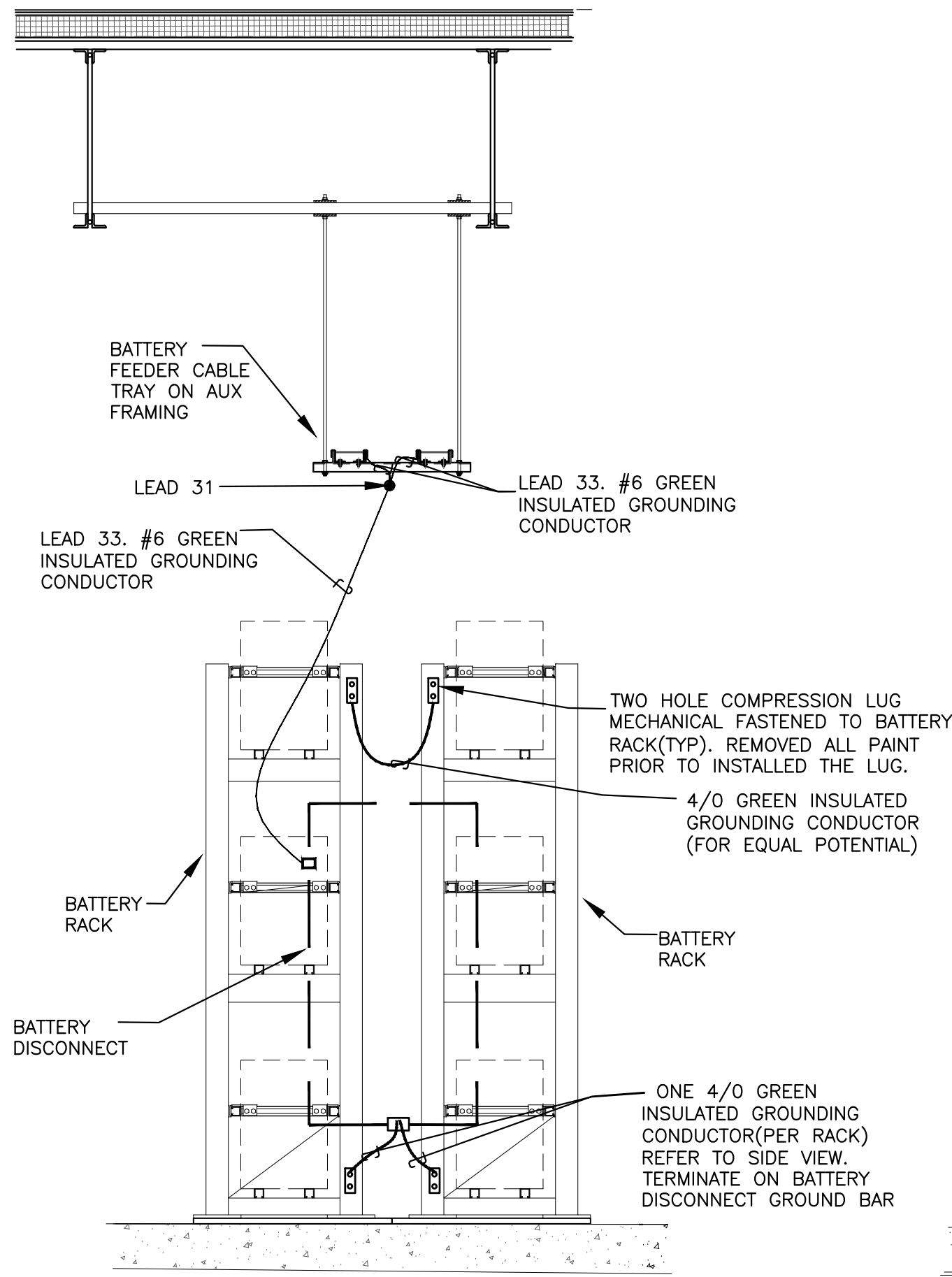
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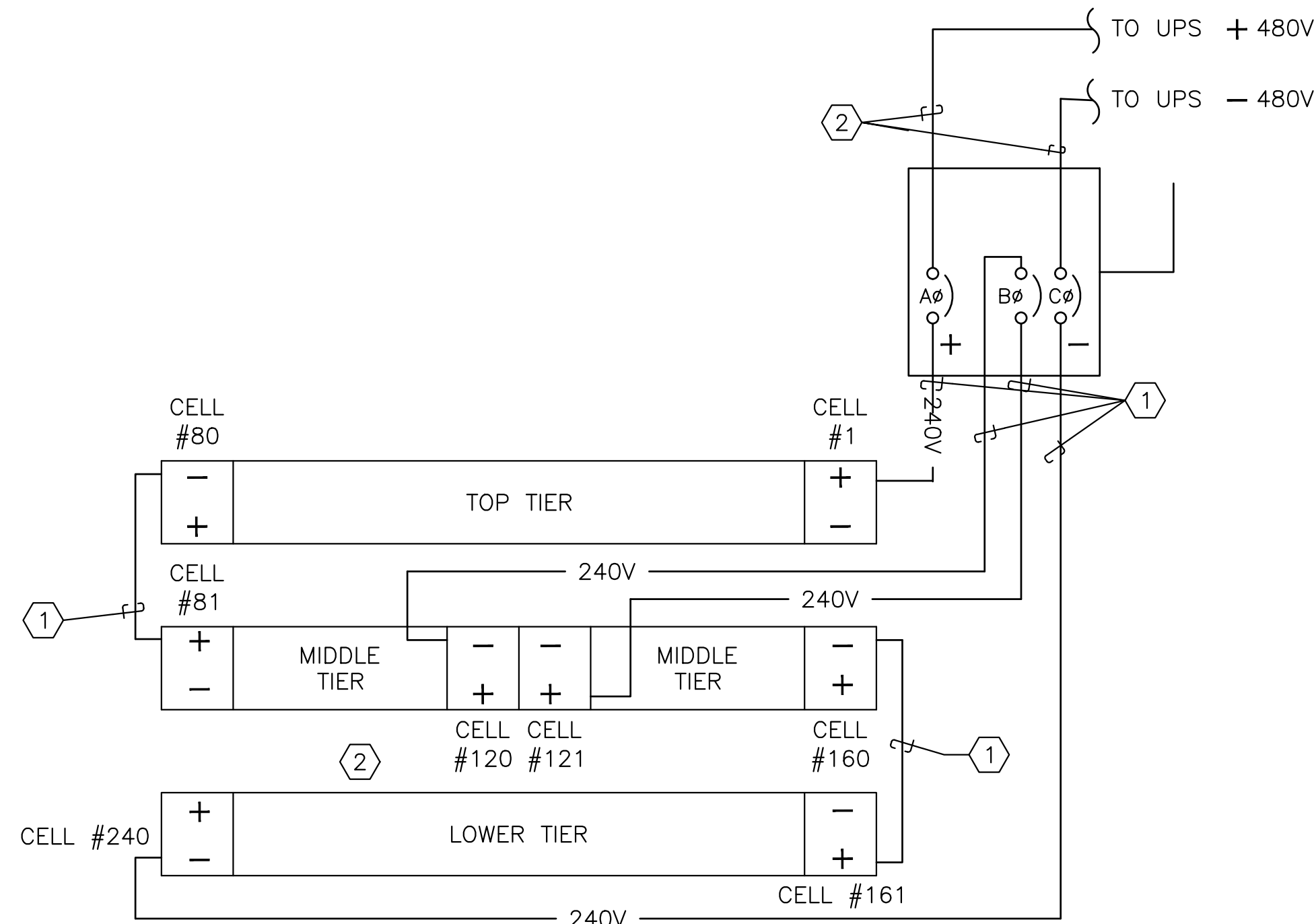


NOTE:

1. BATTERY DISCONNECT EQUIPMENT GROUNDING CONDUCTOR SIZED PER NEC 250.122 FOR 1600A BATTERY DISCONNECT IS 4/0 AWG CU.
2. GROUND CONDUCTORS SHALL BE GREEN INSULATED PER SPECIFICATION 260526/NSTD33. GROUND CONDUCTOR TAPS SHALL BE MADE WITH SPLIT C COPPER COMPRESSION TAPS PER SPECIFICATION 260526/NSTD33.
3. GROUND CABLE LUGS SHALL BE TWO-HOLE COMPRESSION COPPER OR TINNED-COPPER WITH INSPECTION PORTS PER SPECIFICATION 260526/NSTD33.
4. MATING SURFACES WHERE LUGS ARE ATTACHED MUST BE CLEANED AND LIGHTLY COATED WITH A NON-OXIDIZING TYPE CONDUCTIVE GREASE PER SPECIFICATION 260526/NSTD33. PAINT SHALL BE REMOVED FROM THE RACK MATING SURFACE AT THE LUG.
5. GROUNDING CONDUCTORS SHALL NOT BE ROUTED ON CABLE RACKS WITH POWER CABLE (NSTD 119)
6. GROUND CONDUCTORS SHALL NOT HAVE AN UNSUPPORTED LENGTH GREATER THAN 18" (NSTD33).
7. PIGGY-BACKING (STACKING) OF GROUND LUGS IS NOT PERMITTED (NSTD33)

1 UPS AND BATTERY DISCONNECT GROUNDING DETAIL

SCALE: NTS



ELECTRICAL NOTES:

- 1 (4) SETS 2-600KCMIL TELCO FLEX RHH2 COPPER CONDUCTOR ON BATTERY CABLE RACK (REFER TO DETAIL 1-THIS SHEET FOR GROUNDING CONDUCTOR WHICH IS 4/0 GREEN INSULATED COPPER CONDUCTOR ROUTED BETWEEN DISCONNECT GROUND BAR AND EACH RACK AS SHOWN.
- 2 (4) SETS OF EACH 2-600KCMIL, & 4/0G IN 3" CONDUIT. REFER TO DRAWING E704 FOR DETAILS.
- 3 REFER TO DRAWING 5/SA503 FOR RACK SUPPORT DETAILS.

2 BATTERY AND DISCONNECT WIRING DIAGRAM

SCALE: NTS

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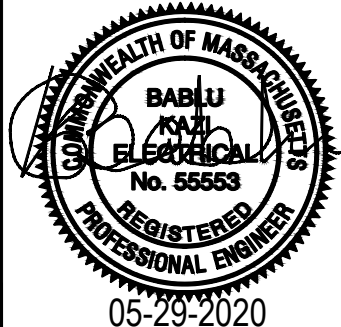
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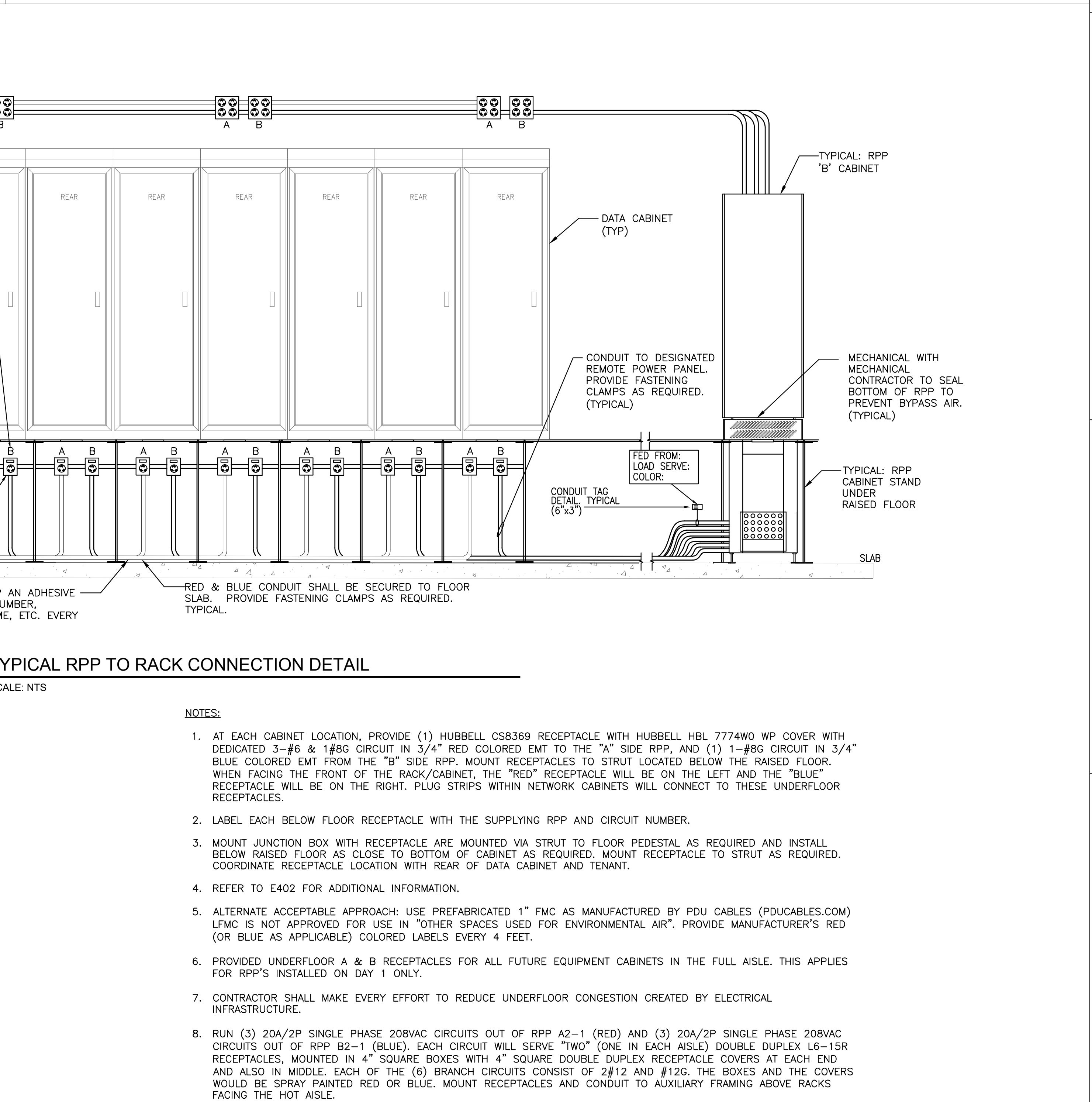
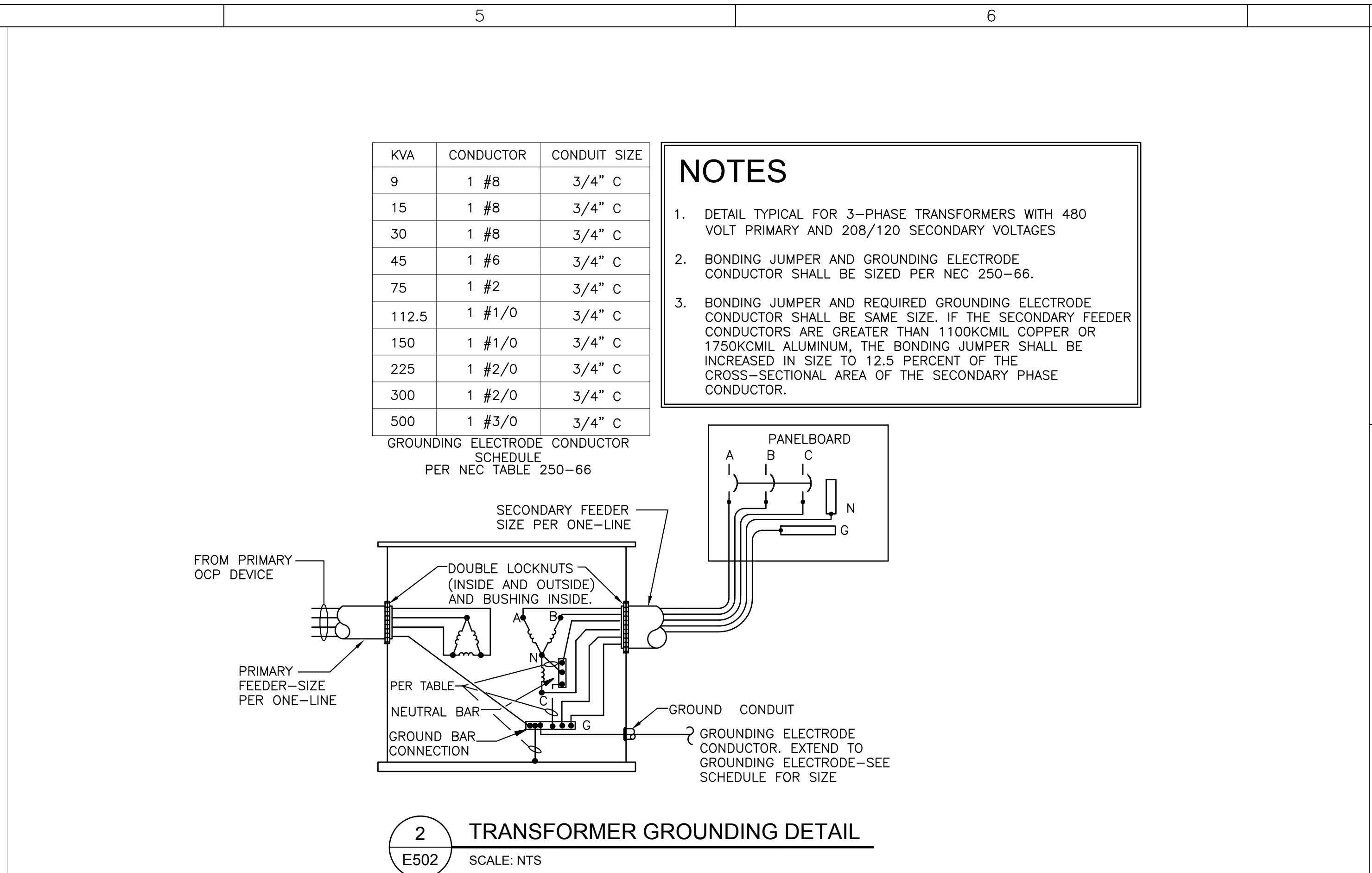
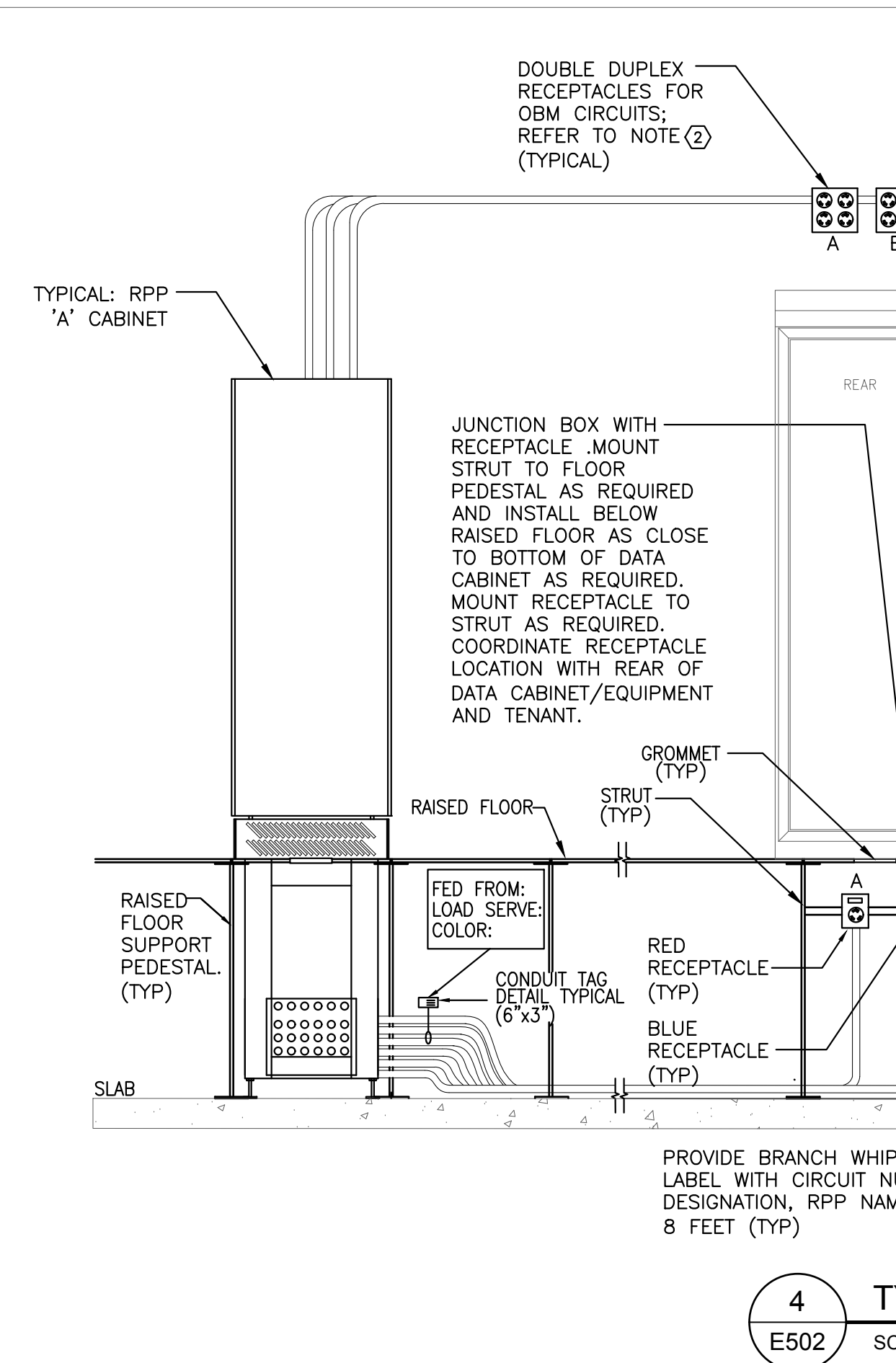
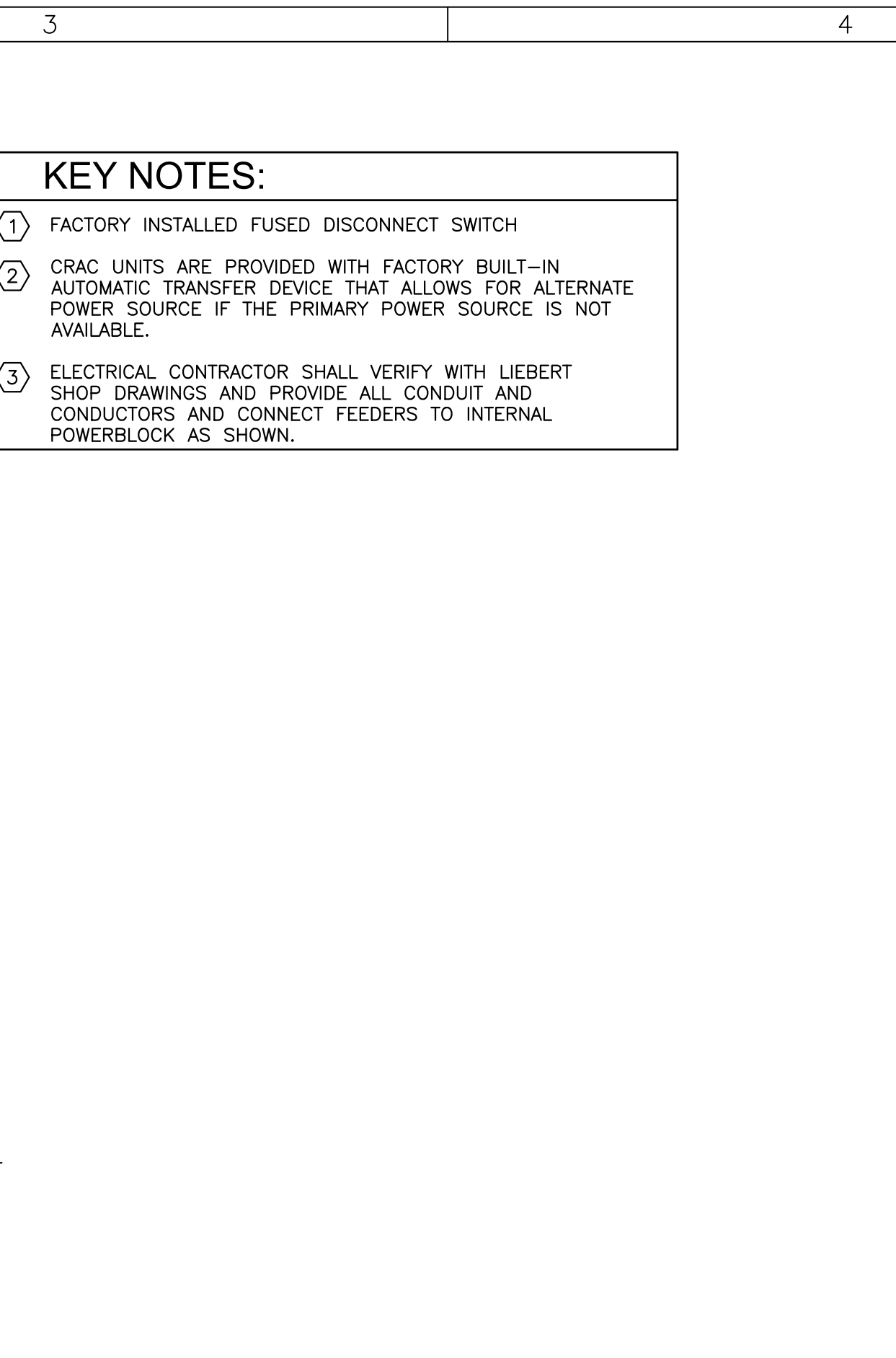
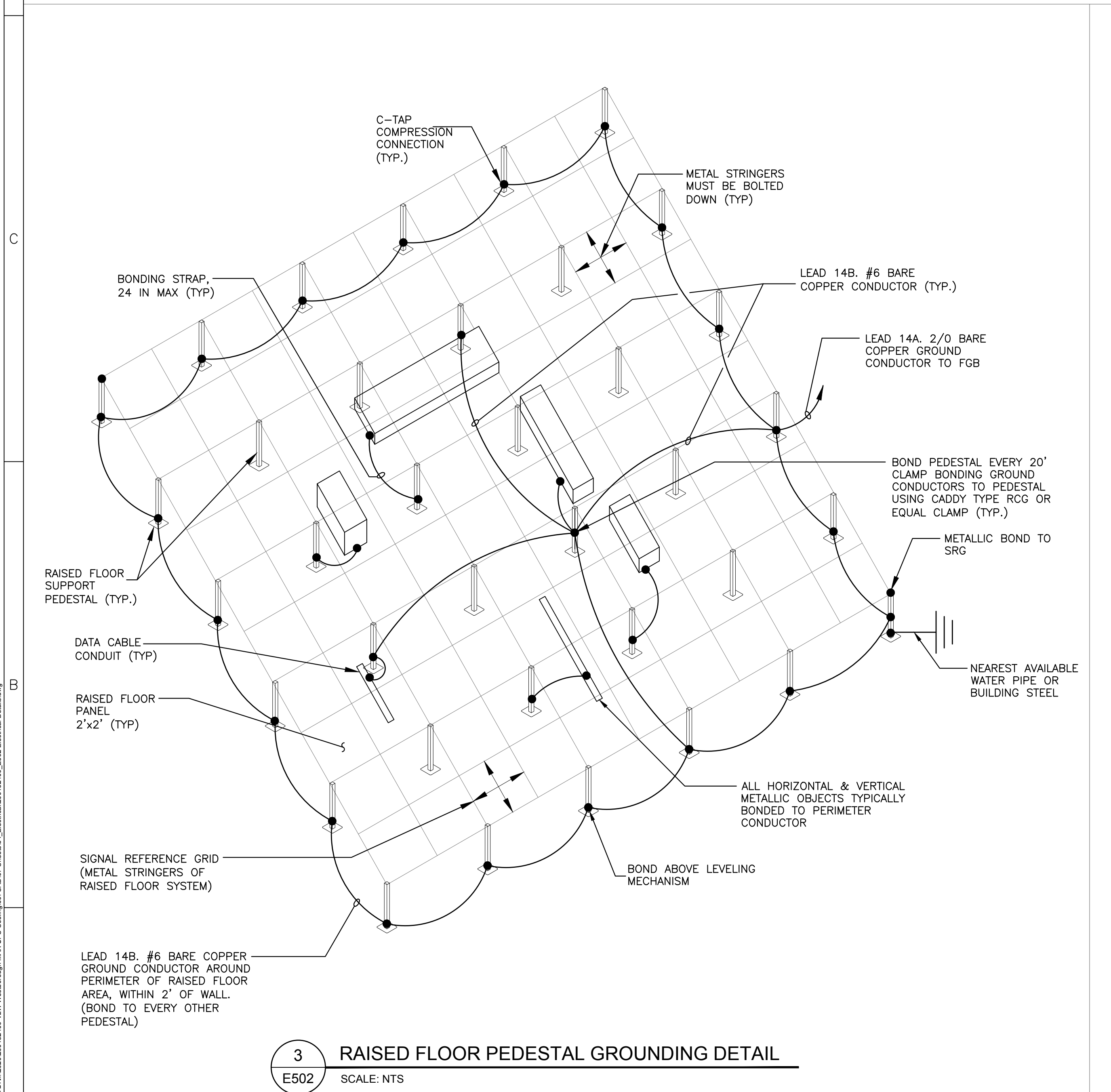
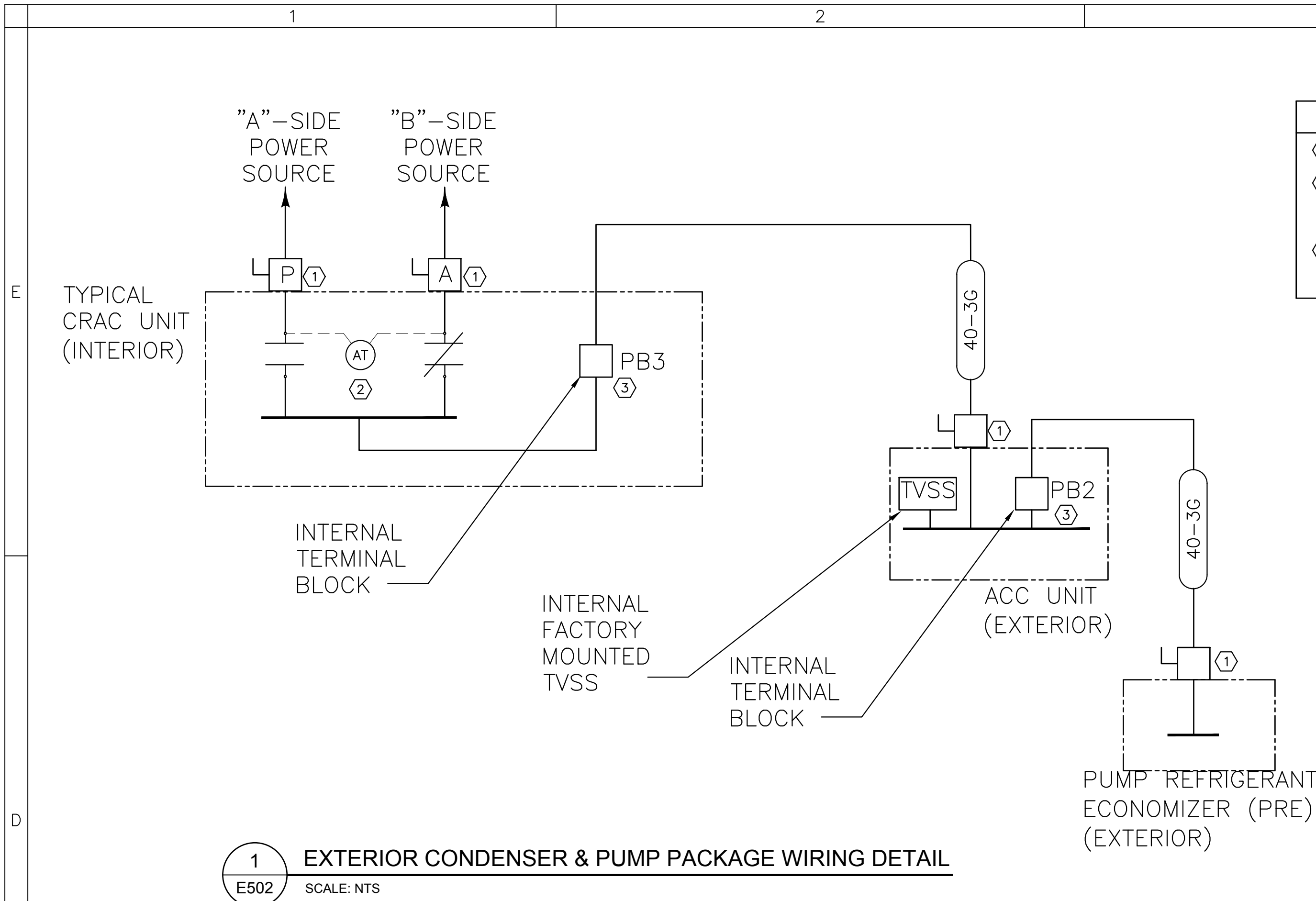
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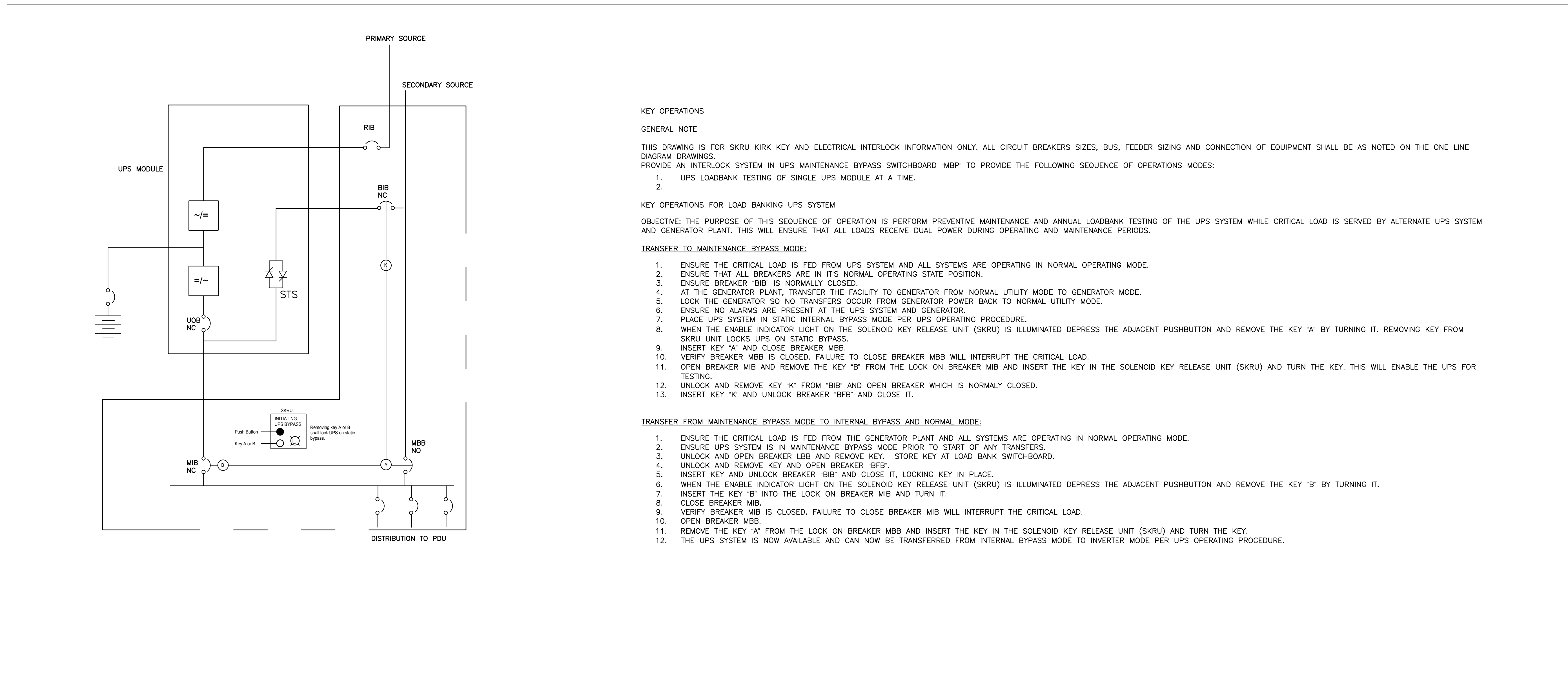
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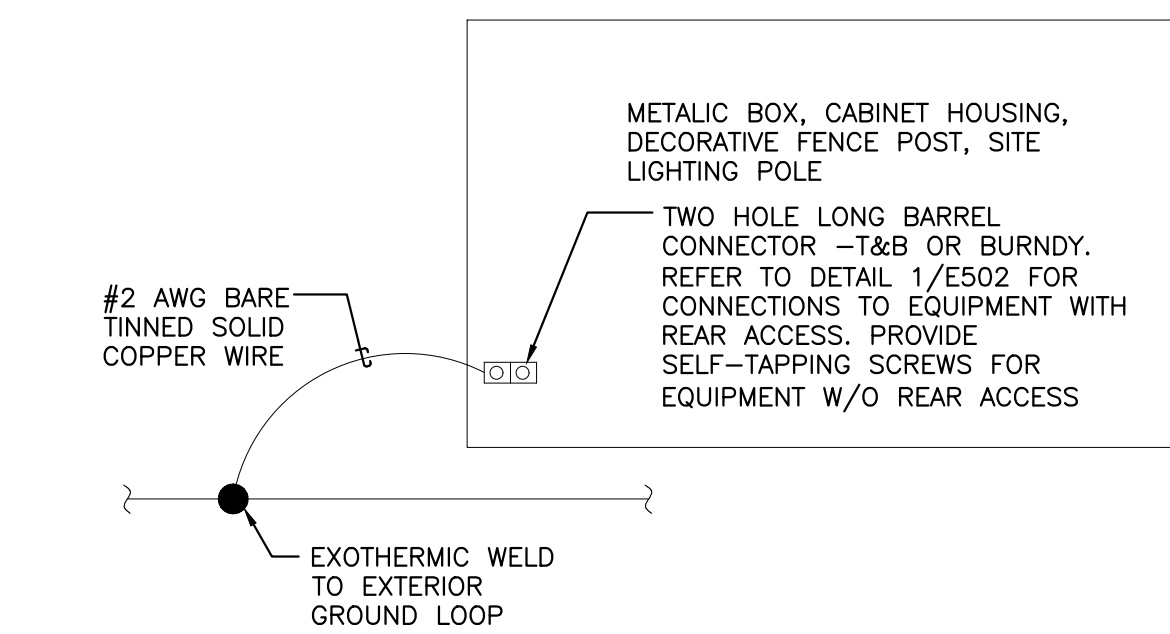


SHEET TITLE	ELECTRICAL DETAILS
SHEET NUMBER	E501





1 E503 SKRU DIAGRAM AND SEQUENCE OF OPERATION DETAIL SCALE: NTS




2 TYPICAL METALLIC CABINET GROUNDING DETAIL
E503 SCALE: NTS

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ELECTRICAL DETAILS

SHEET NUMBER **E503**

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LIGHTING FIXTURE SCHEDULE										
TYPE	FIXTURE DESCRIPTION	MANUFACTURER	CATALOG NUMBER	VOLT	LUMEN OUTPUT	COLOR TEMP	FIXTURE WATTAGE	FIXTURE MOUNTING	DRIVER	REMARKS
A4	LINEAR LED FIXTURE WITH MOUNTING BRACKETS FOR ROW MOUNTING	AIREY THOMPSON	51LN48	M-VOLT	2800	40K	23 WATTS LED	SURFACE MOUNT		MOUNT FIXTURE FLUSH TO THE LOWEST LEVEL OF CABLING UNISTRUT. PROVIDE ALL NECESSARY MOUNTING BRACKETS FOR COMPLETE INSTALLATION.
A8	LINEAR LED FIXTURE WITH MOUNTING BRACKETS FOR ROW MOUNTING	AIREY THOMPSON	51LN96	M-VOLT	2800	40K	32 WATTS LED	SURFACE MOUNT		MOUNT FIXTURE FLUSH TO THE LOWEST LEVEL OF CABLING UNISTRUT. PROVIDE ALL NECESSARY MOUNTING BRACKETS FOR COMPLETE INSTALLATION.
B	2X4 RECESSED 'LED' FIXTURE, ELECTROGALVANIZED, COLD ROLLED, COMMERCIAL QUALITY PAINT COATING.	G.E. LIGHTING LITHONIA	BR220A2AWHITE OR APPROVED EQUAL	M-VOLT	3325	3500K	37 WATTS LED	RECESSED IN T-GRID		-
C	PENDANT MOUNTED WRAPAROUND LED LIGHT FIXTURE.	LITHONIA GE LIGHTING	LBL4 30L EZ1	M-VOLT	4000	3500K	39 WATTS	PENDANT		REFER TO FLOOR PLANS FOR MOUNTING HEIGHT. PROVIDE ALL NECESSARY MOUNTING BRACKETS.
D	WALL MOUNTED WRAPAROUND LED LIGHT FIXTURE.	LITHONIA GE LIGHTING	WL4 40L LP835	M-VOLT	4000	3500K	32 WATTS LED	WALL MOUNTED		FIXTURES SHALL BE MOUNTED 8'-0" AFF. UNLESS OTHERWISE ANNOTATED ON DRAWINGS.
E	WALL MOUNT LED FIXTURE	LITHONIA GE LIGHTING	TWP LED 30C 700 4K T3M DDBXD	M-VOLT	-	4000K	-	WALL MOUNTED		COORDINATE EXACT MOUNTING HEIGHT WITH ARCHITECT.
F	RECESSED COMPACT LED DOWN LIGHT, NOMINAL 6" APERTURE WHITE PAINT, SEMI DIFFUSED REFLECTOR.	G.E. LIGHTING LITHONIA	DI-6R-30-930-10/R-D16R-W-SD-WT OR APPROVED EQUAL	M-VOLT	2480	3000K	43 WATTS LED	RECESSED	0-10V DIMMING DRIVER	PROVIDE HANGER BARS FOR GRID OR DRYWALL CEILINGS.
G	FIXTURE: LED SINGLE HEADED FIXTURE 1000mA DRIVER FORWARD THROW POLE: 25'-0" SQUARE STRAIGHT STEEL POLE WITH BRONZE FINISH AND 3'-0" BASE	LITHONIA GE LIGHTING	DSX1 LED 30C 1000 30K T3M SPA POLE: SSS164C	M-VOLT	8156	3000K	(1) 400W LED HEADS	25'-0" POLE OR LOWER MOUNTED ON 3'-0" BASE.		REFER TO POLE BASE DETAIL 3/E505. SEE SITE LIGHTING PLAN FOR ORIENTATION. NOTE: FIXTURE TO BE 30'-0" FROM ELEVATION 495'-(0'-0"). POLE BASE WILL BE SAME, HOWEVER POLE HEIGHT MAY VARY.
H	MEDIUM FULL CUTOFF WALL PACK, MOUNTED ON GENERATOR ENCLOSURE.	LITHONIA GE LIGHTING	CSXW LED 30C 1000 40K T3M DDBXD	M-VOLT	-	5000K	-	WALL MOUNTED 12'-0" ABOVE FINISHED GRADE		COORDINATE EXACT MOUNTING HEIGHT WITH ARCHITECT.
I	COVE STRIP LIGHT	LITHONIA GE LIGHTING	MNSL MV M6	M-VOLT	2100	5000K	24 WATTS LED	COVE		-
J	PENDANT MOUNTED WRAPAROUND LED LIGHT FIXTURE.	LITHONIA GE LIGHTING	LBL4 30L EZ1	M-VOLT	4000	3500K	39 WATTS	PENDANT		REFER TO FLOOR PLANS FOR MOUNTING HEIGHT. PROVIDE ALL NECESSARY MOUNTING BRACKETS.
EM	THERMOPLASTIC EMERGENCY LIGHT FIXTURE	SOUTHERN LIGHTING LITHONIA	LTEM-WH OR APPROVED EQUAL	M-VOLT	-	-	(2) 1 WATT LED HEADS	MOUNTED AT 13'		SURFACE MOUNT 6" ABOVE DOOR HEADER - SEE LIGHTING PLANS FOR EXACT LOCATION.
EMXT	WALL MOUNTED EMERGENCY EXTERIOR EGRESS LUMINAIRE	SIGNTEX	MAE-BB-10-A-W-DG	M-VOLT	-	-	10 WATTS LED	WALL MOUNT		PROVIDE STANDARD DEEP J=BOX 4"x4"x2-1/8" - FIXTURE TO BE MOUNTED FLUSH WITH WALL. - SEE ARCHITECTURAL ELEVATIONS FOR MOUNTING HEIGHT AND LOCATIONS.
X	EXIT SIGN WITH EMERGENCY BATTERY BACKUP, SINGLE OR DOUBLE FACE WITH UNIVERSAL MOUNT, PROVIDE UNIVERSAL KNOCKOUTS, PROVIDE RED LED LIGHTS, REFER TO LOCAL CODE. PROVIDE WITH NICKEL-CADMIUM BATTERY WITH SELF DIAGNOSTICS.	LSI LITHONIA	VE-U-6-R-1C-WB-SA OR APPROVED EQUAL	M-VOLT	-	-	LED	CEILING OR WALL		REFER TO DRAWINGS FOR MOUNTING TYPES AND ARROW REQUIREMENTS.
X2	EXIT SIGN WITH EMERGENCY BATTERY BACKUP, SINGLE FACE WITH UNIVERSAL MOUNT, PROVIDE UNIVERSAL KNOCKOUTS, PROVIDE RED LED LIGHTS, REFER TO LOCAL CODE. PROVIDE WITH NICKEL-CADMIUM BATTERY WITH SELF DIAGNOSTICS.	LSI LITHONIA	LE-S-1-R-EL N OR APPROVED EQUAL	M-VOLT	-	-	LED	WALL MOUNT		SURFACE MOUNT SUCH THAT TOP OF EXIT IS SIGN IS 18" A.F.F. - SEE LIGHTING PLANS FOR EXACT LOCATION.

LUMINAIRE MOUNTING HEIGHTS		
ROOM NAME	FIXTURE TYPE	MOUNTING HEIGHT
BATTERY/UPS	PENDANT MOUNTED LED	10' AFF
AC POWER	PENDANT MOUNTED LED	10' AFF
STORAGE	PENDANT MOUNTED LED	10' AFF
HVAC AREA	WALL MOUNTED WRAP AROUND	10' AFF
EQUIPMENT ROOM	PENDANT MOUNTED LED	14' AFF
CORRIDORS	WALL MOUNTED WRAP AROUND	9' AFF

FOR INFORMATION ONLY



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1455 LINCOLN PARKWAY, SUITE 500
ATLANTA, GA 30346
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verizon
WESTBOROUGH MEC PHASE 2
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

Δ REV	DESCRIPTION	DATE
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NETWORK COMPLIANCE SUBMITTALS		DATE
ISSUED FOR EOS REVIEW		03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION		03.27.2020
REISSUED FOR CONSTRUCTION		04.16.2020
ISSUED FOR BUILDING PERMIT		05.29.2020

PROJECT NO:	200132400	<div>STAMP</div> <div>SEAL OF PROFESSIONAL ENGINEER</div> <div>BABLU J. SINGH</div> <div>REGISTERED PROFESSIONAL ENGINEER</div> <div>No. 55553</div> <div>05/29/2020</div>
CAD DWG FILE:	200132400	
DESIGNED BY:	RN	
DRAWN BY:	RN	
CHECKED BY:	BK	
COPYRIGHT:	MARCH 2015	

SHEET TITLE
LIGHTING FIXTURE
SCHEDULE

SHEET NUMBER
E602

2

PANEL: HMA1 (EXISTING)									
RROOM/LOCATION: ELECTRICAL ROOM A									
FED FROM: MDSGB									
VOLTAGE & PHASE: 480Y—3Ø_3W									
MOUNTING: SURFACE									
ENCLOSURE: NEMA 1									
AIC RATING: 65kAIC									
AMPERAGE: 800A									
MAIN: MLO									
DESCRIPTION	KVA	FEEDEE SIZE	BKR	PHASE	BKR	FEEDEE SIZE	KVA	DESCRIPTION	
CRAC-115-1 (FUTURE)	25.3	125-3G	125/3	A 1 B 4 C 6	125/3	125-3G	25.3	CRAC-115-3	
CRAC-115-5 (NEW)	25.3	125-3G	125/3	A 8	125/3	125-3G	25.3	CRAC-115-7 (NEW)	
	25.3	---	---	7 B 10	---	---	25.3		
	25.3	---	---	11 C 12	---	---	25.3		
CRAC-117-1	17.0	40-3G	40/3	A 14	125/3	---	---	SPARE BREAKER	
	17.0	---	---	15 B 16	---	---	---		
	17.0	---	---	17 C 18	---	---	---		
AHU-102	5.3	30-3G	25/3	A 20	40/3	40-3G	17.0	CRAC 117-3 (NEW)	
	5.3	---	---	21 B 22	---	---	17.0		
	5.3	---	---	23 C 24	---	---	17.0		
ACC-119-1	2.3	15-3G	15/3	A 26	20/3	3#10, 1#10 3/4"C	0.0	TVSS	
	2.3	-----	---	27 B 28	---	---	0.0		
	2.3	-----	---	29 C 30	---	---	0.0		
LIGHTING - ROOMS 118,119	1.4	2#12 1#12G 1/2"C	20/1	31 A 32	110/3	-----	0.0	SPARE BREAKER	
LIGHTING - CONTROL ROOM 108	1.6	2#12 1#12G 1/2"C	20/1	33 B 34	---	-----	0.0		
LOWER LEVEL LTG - ROOM 115	1.1	2#12 1#12G 1/2"C	20/1	35 C 36	---	-----	0.0		
ACC-117-2	2.3	15-3G	15/3	37 A 38	150/3	-----	0.0	SPARE BREAKER	
	2.3	-----	---	39 B 40	---	-----	0.0		
	2.3	-----	---	41 C 42	---	-----	0.0		
CONNECTED			D.E.		DEMAND				
EXISTING LOAD	0.0		x	1.25		0.0			
COOLING:	0.0		x	0.00		0.0			
HEATING:	0.0		x	0.00		0.0	KVA LOAD BALANCE PER PHASE:		
KITCHEN:	0.0		PER NEC 220.56			0.0	PHASE A: 100.0%		
LIGHTING:	4.1		x	1.25		5.1	PHASE B: 100.2%		
MOTORS:	435.3		x	1.00		435.3	PHASE C: 99.8%		
LARGEST MOTOR	80.1		PER NEC 220.18(A)			20.0			
OTHER:	0.0		x	1.00		0.0			
RECEPTACLES:	0.0		PER NEC 220.44			0.0	HIGHEST PHASE LOAD		
							555.1 AMPERES		
CONNECTED KVA		439.4	DEMAND KVA:		460.5				
AVERAGE CONNECTED AMPS		528.8	DEMAND AMPS:		555.1				
NOTES:									
(1)- SEE FEEDER SCHEDULE FOR FEEDER SIZE.									
(2)-									
(3)-									
(4)-									
(5)-									

<div> <div> <div>3</div> <div>4</div> </div> <div> <div>5</div> <div>6</div> </div> <div> <div>7</div> <div>8</div> </div> <div> <div>9</div> <div>10</div> </div> <div> <div>11</div> <div>12</div> </div> <div> <div>13</div> <div>14</div> </div> <div> <div>15</div> <div>16</div> </div> <div> <div>17</div> <div>18</div> </div> <div> <div>19</div> <div>20</div> </div> <div> <div>21</div> <div>22</div> </div> <div> <div>23</div> <div>24</div> </div> <div> <div>25</div> <div>26</div> </div> <div> <div>27</div> <div>28</div> </div> <div> <div>29</div> <div>30</div> </div> <div> <div>31</div> <div>32</div> </div> <div> <div>33</div> <div>34</div> </div> <div> <div>35</div> <div>36</div> </div> <div> <div>37</div> <div>38</div> </div> <div> <div>39</div> <div>40</div> </div> <div> <div>41</div> <div>42</div> </div> <div> <div>43</div> <div>44</div> </div> <div> <div>45</div> <div>46</div> </div> <div> <div>47</div> <div>48</div> </div> <div> <div>49</div> <div>50</div> </div> <div> 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<div>330</div> </div> <div> <div>331</div> <div>332</div> </div> <div> <div>333</div> <div>334</div> </div> <div></div></div>

PANEL "INV-SAP"		INTERRUPTING CAPACITY 100 KIC		TYPE: MAINS: 100A SURFACE		LOCATION: ELEC RM. B 116 (EXISTING) FED FROM INVERTER SECTION "PBD13"	
120, 1Ø, 2W (SECTION 1)		FEEDER		MOUNTING:		FEEDER	
DESCRIPTION		FEEDER		PROT.	CIRCUITS	PROT.	DESCRIPTION
SECURITY CAMERAS	2#12,1#12G 1/2"C	20/1	1	2	20/1	ATS-B,GEN-B CONTROLS	--
ATS-A,GEN-A CONTROLS	2#12,1#12G 1/2"C	20/1	3	4	20/1	SPARE BREAKER	--
VESDA-UPS BATTERY RM B	2#12,1#12G 1/2"C	20/1	5	6	20/1	VESDA-SAP EQP RM 115	--
VESDA-UPS BATTERY RM A	2#12,1#12G 1/2"C	20/1	7	8	20/1	VESDA-ROOM 160	--
VESDA-ROOM 161	2#12,1#12G 1/2"C	20/1	9	10	20/1	VESDA-VENDOR TELCO RM 150	--
VESDA-SWITCH RM 151	2#12,1#12G 1/2"C	20/1	11	12	20/1	VESDA-RECTIFIER RM 153	--
VESDA-ELEC RM 155	2#12,1#12G 1/2"C	20/1	13	14	20/1	VESDA-ELEC RM 156	--
VESDA-SWITCH "A" RM 133	2#12,1#12G 1/2"C	20/1	15	16	20/1	VESDA-TELCO/DACS RM 134	--
VESDA-BATT/RECT RM A 135	2#12,1#12G 1/2"C	20/1	17	18	20/1	VESDA-ELEC RM 137	--
SECURITY DOOR HARDWARE	2#12,1#12G 1/2"C	20/1	19	20	20/1	SECURITY DOOR HARDWARE	--
DCP-12,DCP-14,DCP-15	2#12,1#12G 1/2"C	20/1	21	22	20/1	SECURITY DOOR HARDWARE	--
CRAC ALLEY,SAP EQP RM--SS	2#12,1#12G 1/2"C	20/1	23	24	20/1	NCP-1, NCP-2	--
DCP-11,DCP-13	2#12,1#12G 1/2"C	20/1	25	26	20/1	SPARE	--
VESDA-CRAC ALLEY	2#12,1#12G 1/2"C	20/1	27	28	20/1	EQP YARD D01-SC	--
EQP YARD 003-SC	2#12,1#12G 1/2"C	20/1	29	30	20/1	RPP METER	--
SPARE		20/1	31	32	20/1	RPP METER	--
SPARE BREAKER		20/1	33	34	20/1	COLD AISLE	2#12,1#12G 1/2"C 1.0
SPARE		20/1	35	36	20/1	COLD AISLE	2#12,1#12G 1/2"C 1.0
NCP-3	2#12,1#12G 1/2"C	20/1	37	38	20/1	COLD AISLE	2#12,1#12G 1/2"C 1.0
SPARE BREAKER		20/1	39	40	20/1	COLD AISLE	2#12,1#12G 1/2"C 1.0
SPARE BREAKER		20/1	41	42	20/1	SPARE BREAKER	--
SUB-TOTAL		TOTAL: --- KVA				SUB-TOTAL -----	
TYPES OF LOADS (KVA)		CONNECTED	D.F.	DEMAND		NOTES: 1. 120V INVERTER PROTECTED. 2. PROVIDE FEED THRU-LUGS FOR SECTION 2.	
COOLING	--	1.00					
EXISTING LOAD	--	1.00					
HEATING ONLY	--	1.00					
LIGHTING	--	1.25					
MOTORS	--	1.00					
LARGEST MOTOR	--	1.25					
OTHER LOAD	--	1.00					
RECEPTACLES (1ST 10 KVA)	--	1.00					
	--	0.50					
LOAD TOTALS	-- KVA	--	KVA	CONNECTED XXX KVA			
TOTAL VA LOADS	-- AMPS	--	AMPS	DESIGN XXX KVA			
LOAD BALANCE	--	--	AMPS	DEMAND XXX KVA			
	--	--	AMPS	SPARE XXX KVA			

PANEL: HMA2 (EXISTING)											
ROOM/LOCATION: ELECTRICAL ROOM A											
FED FROM: MD5GB											AIC RATING: 65KAIC
VOLTAGE & PHASE: 480Y-3Ø, 3W											AMPERAGE: 800A
MOUNTING: SURFACE											MAIN: MLO
ENCLOSURE: NEMA 1											
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE		BKR	FEEDER SIZE	KVA	DESCRIPTION		
CRAC-115-2	25.3	125-3G	125/3	1	A	2	125/3	25.3	CRAC-115-4		
	25.3	---	---	3	B	4	---	25.3			
	25.3	---	---	5	C	6	---	25.3			
CRAC-115-6 (NEW)	25.3	125-3G	125/3	7	A	8	40-3G	17.0	CRAC-119-2		
	25.3	---	---	9	B	10	---	17.0			
	25.3	---	---	11	C	12	---	17.0			
CRAC-118	17.0	40-3G	40/3	13	A	14	60/3	70-3G	SHORE POWER DISCONNECT		
	17.0	---	---	15	B	16	---	---			
	17.0	---	---	17	C	18	---	---			
CU-108	2.0	20-3G	15/3	19	A	20	15/3	15-3G	2.3		
	2.0	---	---	21	B	22	---	---	ACC-119-3 (NEW)		
	2.0	---	---	23	C	24	---	---			
SPARE BREAKER	---	---	25/3	25	A	26	15/3	3#10 1/80 3/4"C	TVSS		
	---	0	---	27	B	28	---	0	--		
	---	0	---	29	C	30	---	0	--		
ACC-118	2.3	15-3G	15/3	31	A	32	15/3	15-3G	2.3		
	2.3	0	---	33	B	34	---	0	ACC-117-3 (NEW)		
	2.3	0	---	35	C	36	---	0			
ACC-116	2.3	15-3G	15/3	37	A	38	125/3	0	SPARE BREAKER		
	2.3	0	---	39	B	40	---	---			
	2.3	0	---	41	C	42	---	---			
CONNECTED		D.F.		DEMAND							
EXISTING LOAD	0.0		x	1.25		0.0					
COOLING:	0.0		x	0.00		0.0					
HEATING:	0.0		x	0.00		0.0					
KITCHEN:	0.0		PER NEC 220.56			0.0	KVA LOAD BALANCE PER PHASE:				
LIGHTING:	0.0		x	1.25		0.0	PHASE A: 105.3%				
MOTORS:	344.9		x	1.00		344.9	PHASE B: 97.3%				
LARGEST MOTOR	80.1		PER NEC 220.19(A)			20.0	PHASE C: 97.3%				
OTHER:	0.0		x	1.00		0.0					
RECEPTACLES:	0.0		PER NEC 220.44			0.0	HIGHEST PHASE LOAD				
CONNECTED KVA	344.9		DEMAND KVA:			364.9	461.3 AMPERES				
AVERAGE CONNECTED AMPS	415.0		DEMAND AMPS:			461.3					
NOTES:											
(1) - SEE FEEDER SCHEDULE FOR FEEDER SIZE.											
(2) -											
(3) -											
(4) -											
(5) -											

PANEL: HMB2 (EXISTING)											
ROOM/LOCATION: ELECTRICAL ROOM B											
FED FROM: MDSGB										AIC RATING: 65kAIC	
VOLTAGE & PHASE: 480Y—3Ø, 3W										AMPERAGE: 800A	
MOUNTING: SURFACE										MAIN: MLO	
ENCLOSURE: NEMA 1											
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION			
CRAC-115-2	25.3	125-3G	125/3	1 A 2	125/3	125-3G	25.3	CRAC-115-4			
	25.3	---	---	3 B 4	---	---	25.3				
	25.3	---	---	5 C 6	---	---	25.3				
CRAC-115-6 (NEW)	25.3	125-3G	125/3	7 A 8	40/3	40-3G	17.0	CRAC-117-2			
	25.3	---	---	9 B 10	---	---	17.0				
	25.3	---	---	11 C 12	---	---	17.0				
CRAC-116	17.0	40-3G	40/3	13 A 14	60/3	70-3G	---	SHORE POWER DISCONNECT			
	17.0	---	---	15 B 16	---	---	---				
	17.0	---	---	17 C 18	---	---	---				
OUA-1	20.0	125-3G	90/3	19 A 20	20/3	0	0.0	SPARE BREAKER			
	20.0	---	---	21 B 22	---	---	0.0				
	20.0	---	---	23 C 24	---	---	0.0				
ELECTRIC WATER HEATER EWH-1	3.0	30-3G	30/3	25 A 26	20/3	3#10,1#10 3/4"C	0.0	TVSS			
	3.0	---	---	27 B 28	---	---	0.0	--			
	3.0	---	---	29 C 30	---	---	0.0	--			
EUH-125	1.7	20-3G	15/3	31 A 32	50/3	---	0.0	SPARE BREAKER			
	1.7	---	---	33 B 34	---	---	0.0				
	1.7	---	---	35 C 36	---	---	0.0				
SPARE BREAKER	0.0	---	125/3	37 A 38	40/3	40-3G	17.0	CRAC-119-3 (NEW)			
	0.0	---	---	39 B 40	---	---	17.0				
	0.0	---	---	41 C 42	---	---	17.0				
CONNECTED			D.F.			DEMAND					
EXISTING LOAD	0.0		x	1 25		0.0					
COOLING:	0.0		x	0 00		0.0					
HEATING:	0.0		x	0 00		0.0			KVA LOAD BALANCE PER PHASE:		
KITCHEN:	0.0			PER NEC C 220.56		0.0			PHASE A: 100.0%		
LIGHTING:	0.0		x	1 25		0.0			PHASE B: 100.0%		
MOTORS:	449.7		x	1 00		449.7			PHASE C: 100.0%		
LARGEST MOTOR	80.1			PER NEC 220.18(A)		20.0					
OTHER:	0.0		x	1 00		0.0					
RECEPTACLES:	0.0			PER NEC C 220.44		0.0			HIGHEST PHASE LOAD		
									565.3 AMPERES		
CONNECTED KVA		449.7		DEMAND KVA:		469.7					
AVERAGE CONNECTED AMPS		541.2		DEMAND AMPS:		565.3					
NOTES:											
(1):											
(2):											
(3):											
(4):											
(5):											

PANEL "INV-SAP"		INTERRUPTING CAPACITY 10K AIC		TYPE: MAINS: MLOA MOUNTING: SURFACE		LOCATION: ELEC RM. B 116 FED FROM "INV-SAP (SECTION 1)"	
120, 1Ø, 2W (SECTION 2)							
KVA	DESCRIPTION	FEEDER	PROT.	CIRCUITS	PROT.	DESCRIPTION	FEEDER
1.0	NEW BATTERY MONITORING RM A	2#12,1#12G 1/2"	20/1	43	44	20/1	SPARE BREAKER
1.0	NEW BATTERY MONITORING RM B	2#12,1#12G 1/2"	20/1	45	46	20/1	SPARE BREAKER
-	SPARE BREAKER		20/1	47	48	20/1	SPARE BREAKER
-	SPARE BREAKER		20/1	49	50	20/1	NEW 48-PORT SWITCH
-	SPARE BREAKER		20/1	51	52	20/1	NEW 48-PORT SWITCH
-	SPARE BREAKER		20/1	53	54	20/1	NEW 48-PORT SWITCH
-	DCP-18	2#12,1#12G 1/2"	20/1	55	56	20/1	SPARE BREAKER
-	BAS DCP-18E	2#12,1#12G 1/2"	20/1	57	58	20/1	SPARE BREAKER
-	LIGHTING CNTRL ROOM 108	2#12,1#12G 1/2"	20/1	59	60	20/1	NEW RPP METER
-	PQM MDSG3A	2#12,1#12G 1/2"	20/1	61	62	20/1	PQM (PDU-A1, PDU-A2)
-	PQM (HDPA, HMA1, HMA2)	2#12,1#12G 1/2"	20/1	63	64	20/1	PQM (PDU-B1, PDU-B2)
-	PQM MDSG3B	2#12,1#12G 1/2"	20/1	65	66	20/1	PQM (PDU-A3, PDU-A4) (NEW)
-	PQM (HDPB, HMB1, HMB2)	2#12,1#12G 1/2"	20/1	67	68	20/1	PQM (PDU-B3, PDU-B4) (NEW)
1.5	NEW VESDA PANELS	2#12,1#12G 1/2"	20/1	69	70	20/1	BATT. MON. SYST. CONTROLLER
-	SPARE		20/1	71	72	20/1	BATT. MON. SYST. CONTROLLER
-	SPARE		20/1	73	74	20/1	BAS ICOMS & PNEUM
-	SPARE		20/1	75	76	20/1	NEW RPP METER
-	BAS DCP-19	2#12,1#12G 1/2"	20/1	77	78	20/1	NEW RPP METER
-	SPARE BREAKER		20/1	79	80	20/1	NEW RPP METER
-	SPARE BREAKER		20/1	81	82	20/1	NEW RPP METER
-	SPARE BREAKER		20/1	83	84	20/1	NEW RPP METER
SUB-TOTAL			TOTAL: --- KVA		SUB-TOTAL		
TYPES OF LOADS (KVA)		CONNECTED	D.F.	DEMAND		NOTES: 1. 120V INVERTER PROTECTED 2. PROVIDE FEED-THRU LUGS FOR SECTION 2.	
COOLING		-	1.00				
EXISTING LOAD		-	1.00				
HEATING ONLY		-	1.00				
LIGHTING		-	1.25				
MOTORS		-	1.00				
LARGEST MOTOR		-	1.25				
OTHER LOADS		-	1.00				
RECEPTACLES (1ST 10 KVA)		-	1.00				
		-	0.50				
LOAD TOTALS		- KVA	-	KVA	CONNECTED	XXX. KVA	
TOTAL VA LOADS		- AMPS	-	AMPS	DESIGN	XXX. KVA	
TOTAL BALANCE		-	-	AMPS	DEMAND	XXX. KVA	
		-	-	AMPS	SPARE	XXX. KVA	

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WESTBOROUGH MEC PHASE 2
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

Δ REV	DESCRIPTION	DATE
Δ		
-		
-		
-		
-		
-		

NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

PROJECT NO:	200132400	STAMP
CAD DWG FILE:	200132400	
DESIGNED BY:	RN	
DRAWN BY:	RN	
CHECKED BY:	BK	
COPYRIGHT:	MARCH 2015	
		05-29-2020

SHEET TITLE	PANEL SCHEDULES
SHEET NUMBER	E603

HMA1	HMB1	INV SAP
HMA2	HMB2	INV SAP (SEC 2)

PANEL: RPP-A114 (SECTION 2)												
ROOM/LOCATION: NEC												
FED FROM: PDU-A1 (EXIST)												
A/C RATING: 22KVAIC												
AMPERAGE: 400A												
MOUNTING: SURFACE												
MAIN: MCB												
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION				
CABINET 115.704.07	2.3	3#6, 1#10G, 1"C	50/3	43 A 44	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.704.08X				
	2.3	--	--	45 B 46	--	--	2.3	--				
	2.3	--	--	47 C 48	--	--	2.3	--				
CABINET 115.704.08Y	2.3	3#6, 1#10G, 1"C	50/3	49 A 50	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.704.09				
	2.3	--	--	51 B 52	--	--	2.3	--				
	2.3	--	--	53 C 54	--	--	2.3	--				
CABINET 115.704.10	2.3	3#6, 1#10G, 1"C	50/3	55 A 56	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.704.11				
	2.3	--	--	57 B 58	--	--	2.3	--				
	2.3	--	--	59 C 60	--	--	2.3	--				
CABINET 115.704.12X	2.3	3#6, 1#10G, 1"C	50/3	61 A 62	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.704.12Y				
	2.3	--	--	63 B 64	--	--	2.3	--				
	2.3	--	--	65 C 66	--	--	2.3	--				
SPARE	2.3	0	50/3	67 A 68	20/2	2#12, 1#12G, 1/C"	1.7	OBM RECEPTACLE				
	2.3	--	--	69 B 70	--	--	1.7	--				
	2.3	--	--	71 C 72	--	--	1.7	--				
SPARE	--	--	50/3	73 A 74	20/2	2#12, 1#12G, 1/C"	1.7	OBM RECEPTACLE				
	--	--	--	75 B 76	--	--	1.7	--				
	--	--	--	77 C 78	--	--	1.7	--				
SPARE	--	--	50/3	79 A 80	20/2	2#12, 1#12G, 1/C"	1.7	OBM RECEPTACLE				
	--	--	--	81 B 82	--	--	1.7	--				
	--	--	--	83 C 84	--	--	1.7	--				
		CONNECTED		D.F.		DEMAND						
EXISTING LOAD	0.0		x	1.25		0.0						
COOLING	0.0		x	0.00		0.0						
HEATING	0.0		x	0.00		0.0						
KITCHEN:	0.0		PER NEC 220.56			0.0		KVA LOAD BALANCE PER PHASE:				
LIGHTING:	0.0		x 1.25			0.0		PHASE A: 115.2%				
MOTORS:	0.0		x 1.00			0.0		PHASE B: 92.4%				
LARGEST MOTOR	0.0		PER NEC 220.18(A)			0.0		PHASE C: 92.4%				
OTHER:	67.2		x 1.00		67.2			HIGHEST PHASE LOAD				
RECEPTACLES:	0.0		PER NEC 220.44		0.0			215.0 AMPERES				
CONNECTED KVA	67.2			DEMAND KVA:	67.2							
AVERAGE CONNECTED AMPS	186.7			DEMAND AMPS:	215.0							
NOTES:												
1)-												
2)-												
3)-												
4)-												
5)-												

RPP A112 (SEC 1)	RPP A113 (SEC 1) (NEW)	RPP A114 (SEC 1) (NEW)
RPP A112 (SEC 2)	RPP A113 (SEC 2) (NEW)	RPP A114 (SEC 2) (NEW)

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WESTBOROUGH, MA 01581

[illegible]

PANEL
SCHEDULES

E604

PANEL: RPP-A213 (SEC 1)

ROOM/LOCATION: NEC

FED FROM: PDU A2 (EXIST)

VOLTAGE & PHASE: 208Y—3Ø

MOUNTING: SURFACE

AIC RATING: 22kAIC

AMPERAGE: 400A

MAIN: MCB

DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE		BKR	FEEDER SIZE	KVA	DESCRIPTION
CABINET 115.706.01	2.3	3#6, 1#10G, 1" C	50/3	1	A	2	50/3	3#6, 1#10G, 1" C	2.3
—	2.3	—	—	3	B	4	—	—	2.3
—	2.3	—	—	5	C	6	—	—	2.3
CABINET 115.706.03	2.3	3#6, 1#10G, 1" C	50/3	7	A	8	50/3	3#6, 1#10G, 1" C	2.3
—	2.3	—	—	9	B	10	—	—	2.3
—	2.3	—	—	11	C	12	—	—	2.3
CABINET 115.706.04 Y	2.3	3#6, 1#10G, 1" C	50/3	13	A	14	50/3	3#6, 1#10G, 1" C	2.3
—	2.3	—	—	15	B	16	—	—	2.3
—	2.3	—	—	17	C	18	—	—	2.3
CABINET 115.706.06	2.3	3#6, 1#10G, 1" C	50/3	19	A	20	50/3	—	2.3
—	2.3	—	—	21	B	22	—	—	2.3
—	2.3	—	—	23	C	24	—	—	2.3
SPARE	—	—	50/3	25	A	26	50/3	0	SPARE
—	—	—	—	27	B	28	—	—	—
—	—	—	—	29	C	30	—	—	—
SPARE	—	—	50/3	31	A	32	50/3	—	SPARE
—	—	—	—	33	B	34	—	—	—
—	—	—	—	35	C	36	—	—	—
SPARE	—	—	50/3	37	A	38	50/3	—	SPARE
—	—	—	—	39	B	40	—	—	—
—	—	—	—	41	C	42	—	—	—
CONNECTED			D.F.		DEMAND				
EXISTING LOAD	0.0		x	1.25		0.0	KVA LOAD BALANCE PER PHASE: PHASE A: 100.0% PHASE B: 100.0% PHASE C: 100.0%		
COOLING:	0.0		x	0.00		0.0			
HEATING:	0.0		x	0.00		0.0			
KITCHEN:	0.0		PER NEC 220.58			0.0			
LIGHTING:	0.0		x	1.25		0.0			
MOTORS:	0.0		x	1.00		0.0	HIGHEST PHASE LOAD 153.3 AMPERES		
LARGEST MOTOR	0.0		PER NEC 220.18(A)			0.0			
OTHER:	55.2		x	1.00		55.2			
RECEPTACLES:	0.0		PER NEC 220.44			0.0			
CONNECTED KVA	55.2		DEMAND KVA:			55.2			
AVERAGE CONNECTED AMPS	153.3		DEMAND AMPS:			153.3			

NOTES:

- (1)
- (2)
- (3)
- (4)
- (5)

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PANEL: RPP-A213 (SECT 2)

ROOM/LOCATION: NEC

FED FROM: PDU-A2 (EXIST)

VOLTAGE & PHASE: 208Y—3Ø

MOUNTING: SURFACE

A/C RATING: 22kAIC

AMPERAGE: 400A

MAIN: MCB

DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE		BKR	FEEDER SIZE	KVA	DESCRIPTION
CABINET 115.706.07	2.3	3#6, 1#10G, 1" C	50/3	43	A 44	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.706.08X
—	2.3	—	—	45	B 46	—	—	2.3	—
—	2.3	—	—	47	C 48	—	—	2.3	—
CABINET 115.706.08Y	2.3	3#6, 1#10G, 1" C	50/3	49	A 50	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.706.09
—	2.3	—	—	51	B 52	—	—	2.3	—
—	2.3	—	—	53	C 54	—	—	2.3	—
CABINET 115.706.10	2.3	3#6, 1#10G, 1" C	50/3	55	A 56	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.706.11
—	2.3	—	—	57	B 58	—	—	2.3	—
—	2.3	—	—	59	C 60	—	—	2.3	—
CABINET 115.706.12X	2.3	3#6, 1#10G, 1" C	50/3	61	A 62	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.706.12Y
—	2.3	—	—	63	B 64	—	—	2.3	—
—	2.3	—	—	65	C 66	—	—	2.3	—
SPARE	2.3	0	50/3	67	A 68	20/2	2#12, 1#12G, 1/2" C	1.7	OBM RECEPTACLE
—	2.3	—	—	69	B 70	—	—	1.7	—
—	2.3	—	—	71	C 72	—	—	1.7	—
SPARE	—	—	50/3	73	A 74	20/2	2#12, 1#12G, 1/2" C	1.7	OBM RECEPTACLE
—	—	—	—	75	B 76	—	—	1.7	—
—	—	—	—	77	C 78	—	—	1.7	—
SPARE	—	—	50/3	79	A 80	20/2	2#12, 1#12G, 1/2" C	1.7	OBM RECEPTACLE
—	—	—	—	81	B 82	—	—	1.7	—
—	—	—	—	83	C 84	—	—	1.7	—
CONNECTED			O F		DEMAND				
EXISTING LOAD	0.0		x	1.25		0.0		KVA LOAD BALANCE PER PHASE. PHASE A: 115.2% PHASE B: 92.4% PHASE C: 92.4%	
COOLING:	0.0		x	0.00		0.0			
HEATING:	0.0		x	0.00		0.0			
KITCHEN:	0.0		PER NEC 220.56			0.0			
LIGHTING:	0.0		x	1.25		0.0			
MOTORS:	0.0		x	1.00		0.0			
LARGEST MOTOR	0.0		PER NEC 220.18(A)			0.0			
OTHER:	67.2		x	1.00		67.2		HIGHEST PHASE LOAD	
RECEPTACLES:	0.0		PER NEC 220.44			0.0		215.0 AMPERES	
CONNECTED KVA		67.2	DEMAND KVA:		67.2				
AVERAGE CONNECTED AMPS		186.7	DEMAND AMPS:		215.0				

NOTES:

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(5)-

PANEL: RPP-A214 (SECT 2)									
ROOM/LOCATION: NEC									
FED FROM: PDU-A2 (EXIST)									
VOLTAGE & PHASE: 208Y-3Ø									
MOUNTING: SURFACE									
A/C RATING: 22kAIC									
AMPERAGE: 400A									
MAIN: MCB									
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION	
CABINET 115.705.07	2.3	3#6, 1#10G, 1"C	50/3	43 A 44	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.705.08X	
-	2.3	-	-	45 B 46	-	-	2.3	-	
-	2.3	-	-	47 C 48	-	-	2.3	-	
CABINET 115.705.08Y	2.3	3#6, 1#10G, 1"C	50/3	49 A 50	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.705.09	
-	2.3	-	-	51 B 52	-	-	2.3	-	
-	2.3	-	-	53 C 54	-	-	2.3	-	
CABINET 115.705.10	2.3	3#6, 1#10G, 1"C	50/3	55 A 56	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.705.11	
-	2.3	-	-	57 B 58	-	-	2.3	-	
-	2.3	-	-	59 C 60	-	-	2.3	-	
CABINET 115.705.12X	2.3	3#6, 1#10G, 1"C	50/3	61 A 62	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.705.12Y	
-	2.3	-	-	63 B 64	-	-	2.3	-	
-	2.3	-	-	65 C 66	-	-	2.3	-	
SPARE	2.3	0	50/3	67 A 68	20/2	2#12, 1#12G, 1/C"	1.7	OBM RECEPTACLE	
-	2.3	-	-	69 B 70	-	-	1.7	-	
-	2.3	-	-	71 C 72	-	-	1.7	-	
SPARE	-	-	50/3	73 A 74	20/2	2#12, 1#12G, 1/C"	1.7	OBM RECEPTACLE	
-	-	-	-	75 B 76	-	-	1.7	-	
-	-	-	-	77 C 78	-	-	1.7	-	
SPARE	-	-	50/3	79 A 80	20/2	2#12, 1#12G, 1/C"	1.7	OBM RECEPTACLE	
-	-	-	-	81 B 82	-	-	1.7	-	
-	-	-	-	83 C 84	-	-	1.7	-	
	CONNECTED		D.F.	DEMAND					
EXISTING LOAD	0.0		x 1.25	0.0					
COOLING:	0.0		x 0.00	0.0					
HEATING:	0.0		x 0.00	0.0				KVA LOAD BALANCE PER PHASE:	
KITCHEN:	0.0		PER NEC 220.56	0.0				PHASE A: 115.2%	
LIGHTING:	0.0		x 1.25	0.0				PHASE B: 92.4%	
MOTORS:	0.0		x 1.00	0.0				PHASE C: 92.4%	
LARGEST MOTOR	0.0		PER NEC 220.18(A)	0.0					
OTHER:	67.2		x 1.00	67.2				HIGHEST PHASE LOAD	
RECEPTACLES:	0.0		PER NEC 220.44	0.0				215.0 AMPERES	
CONNECTED KVA	67.2		DEMAND KVA:	67.2					
AVERAGE CONNECTED AMPS	186.7		DEMAND AMPS:	215.0					
NOTES:									
(1)-									
(2)-									
(3)-									
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RPP A213 (SEC 1) (NEW)	RPP A214 (SEC 1) (NEW)	RPP A311 (SEC 1) (NEW)
RPP A213 (SEC 2) (NEW)	RPP A214 (SEC 2) (NEW)	RPP A311 (SEC 2) (NEW)

Do not scale drawings. Contractor must verify all dimensions and advise Consultants of any errors or omissions. No variations or modifications to work shown shall be implemented without prior written approval. All previous issues of this drawing are superseded by the latest revision. All drawings and specifications remain the property of Morrison Hershfield Corporation.

verizon[✓]
WESTBOROUGH MEC PHASE 2
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

[illegible]

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PANEL: RPP-A312 (SECT 2)

ROOM/LOCATION: NEC

FED FROM: PDU-A3

VOLTAGE & PHASE: 208Y—3Ø

MOUNTING: SURFACE

AIC RATING: 22kAIC

AMPERAGE: 400A

MAIN: MCB

DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION
CABINET 115.710.07	2.3	3#6, 1#10G, 1" C	50/3	43 A 44	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.710.08X
--	2.3	--	--	45 B 46	--	--	2.3	--
--	2.3	--	--	47 C 48	--	--	2.3	--
CABINET 115.710.08Y	2.3	3#6, 1#10G, 1" C	50/3	49 A 50	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.710.09
--	2.3	--	--	51 B 52	--	--	2.3	--
--	2.3	--	--	53 C 54	--	--	2.3	--
CABINET 115.710.10	2.3	3#6, 1#10G, 1" C	50/3	55 A 56	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.710.11
--	2.3	--	--	57 B 58	--	--	2.3	--
--	2.3	--	--	59 C 60	--	--	2.3	--
CABINET 115.710.12X	2.3	3#6, 1#10G, 1" C	50/3	61 A 62	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.710.12Y
--	2.3	--	--	63 B 64	--	--	2.3	--
--	2.3	--	--	65 C 66	--	--	2.3	--
SPARE	2.3	0	50/3	67 A 68	20/2	2#12, 1#12G, 1/1" C	1.7	OBM RECEPTACLE
--	2.3	--	--	69 B 70	--	--	1.7	--
--	2.3	--	--	71 C 72	--	--	1.7	--
SPARE	--	--	50/3	73 A 74	20/2	2#12, 1#12G, 1/1" C	1.7	OBM RECEPTACLE
--	--	--	--	75 B 76	--	--	1.7	--
--	--	--	--	77 C 78	--	--	1.7	--
SPARE	--	--	50/3	79 A 80	20/2	2#12, 1#12G, 1/1" C	1.7	OBM RECEPTACLE
--	--	--	--	81 B 82	--	--	1.7	--
--	--	--	--	83 C 84	--	--	1.7	--
CONNECTED			D.F.		DEMAND			
EXISTING LOAD	0.0			x 1.25			0.0	
COOLING:	0.0			x 0.00			0.0	
HEATING:	0.0			x 0.00			0.0	
KITCHEN:	0.0	PER NEC 220.56				0.0		KVA LOAD BALANCE PER PHASE:
LIGHTING:	0.0	x 1.25				0.0		PHASE A: 115.2%
MOTORS:	0.0	x 1.00				0.0		PHASE B: 92.4%
LARGEST MOTOR	0.0	PER NEC 220.18(A)				0.0		PHASE C: 92.4%
OTHER:	67.2	x 1.00		67.2				HIGHEST PHASE LOAD
RECEPTACLES:	0.0	PER NEC 220.44		0.0				215.0 AMPERES
CONNECTED KVA		67.2	DEMAND KVA:		67.2			
AVERAGE CONNECTED AMPS		186.7	DEMAND AMPS:		215.0			
NOTES:								
(1)								
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(4)								
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PANEL: RPP-A313 (SEC 1)

ROOM/LOCATION: NEC

FED FROM: PDU A3

VOLTAGE & PHASE: 208Y—3Ø

MOUNTING: SURFACE

AIC RATING: 22kAIC

AMPERAGE: 400A

MAIN: MCB

DESCRIPTION		KVA	FEEDER SIZE	BKR	PHASE		BKR	FEEDER SIZE	KVA	DESCRIPTION	
CABINET 115.709.01		2.3	3#6, 1#10G, 1" C	50/3	1	A	2	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.709.02
--		2.3	--	--	3	B	4	--	--	2.3	--
--		2.3	--	--	5	C	6	--	--	2.3	--
CABINET 115.709.03		2.3	3#6, 1#10G, 1" C	50/3	7	A	8	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.709.04 X
--		2.3	--	--	9	B	10	--	--	2.3	--
--		2.3	--	--	11	C	12	--	--	2.3	--
CABINET 115.709.04 Y		2.3	3#6, 1#10G, 1" C	50/3	13	A	14	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.709.05
--		2.3	--	--	15	B	16	--	--	2.3	--
--		2.3	--	--	17	C	18	--	--	2.3	--
CABINET 115.709.06		2.3	3#6, 1#10G, 1" C	50/3	19	A	20	50/3	--	2.3	SPARE
--		2.3	--	--	21	B	22	--	--	2.3	--
--		2.3	--	--	23	C	24	--	--	2.3	--
SPARE		--	--	50/3	25	A	26	50/3	0	--	SPARE
--		--	--	--	27	B	28	--	--	--	--
--		--	--	--	29	C	30	--	--	--	--
SPARE		--	--	50/3	31	A	32	50/3	--	--	SPARE
--		--	--	--	33	B	34	--	--	--	--
--		--	--	--	35	C	36	--	--	--	--
SPARE		--	--	50/3	37	A	38	50/3	--	--	SPARE
--		--	--	--	39	B	40	--	--	--	--
--		--	--	--	41	C	42	--	--	--	--
CONNECTED				D.F.				DEMAND			
EXISTING LOAD		0.0			x	1.25			0.0		
COOLING:		0.0			x	0.00			0.0		
HEATING:		0.0			x	0.00			0.0		
KITCHEN:		0.0			PER NEC 220.56				0.0		
LIGHTING:		0.0			x	1.25			0.0		
MOTORS:		0.0			x	1.00			0.0		
LARGEST MOTOR		0.0			PER NEC 220.18(A)				0.0		
OTHER:		55.2			x	1.00			55.2		
RECEPTACLES:		0.0			PER NEC 220.44				0.0		
CONNECTED KVA		55.2			DEMAND KVA:				55.2		
AVERAGE CONNECTED AMPS		153.3			DEMAND AMPS:				153.3		

NOTES:
(1):
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(5):

KVA LOAD BALANCE PER PHASE:
PHASE A: 100.0%
PHASE B: 100.0%
PHASE C: 100.0%

HIGHEST PHASE LOAD
153.3 AMPERES

[illegible]

PANEL: RPP-A321 (SEC1) (EXIST)

ROOM/LOCATION: NEC

FED FROM:

VOLTAGE & PHASE: 208Y—3Ø

MOUNTING: SURFACE

AIC RATING: 22kAIC

AMPERAGE: 400A

MAIN: MCB

DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION
CABINET 115.713.01	2.3	3#6, 1#10G, 1" C	50/3	1 A 2	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.713.02
—	2.3	—	—	3 B 4	—	—	2.3	—
—	2.3	—	—	5 C 6	—	—	2.3	—
CABINET 115.713.03	2.3	3#6, 1#10G, 1" C	50/3	7 A 8	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.713.04 X
—	2.3	—	—	9 B 10	—	—	2.3	—
—	2.3	—	—	11 C 12	—	—	2.3	—
CABINET 115.713.04 Y	2.3	3#6, 1#10G, 1" C	50/3	13 A 14	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.713.05
—	2.3	—	—	15 B 16	—	—	2.3	—
—	2.3	—	—	17 C 18	—	—	2.3	—
CABINET 115.713.06	2.3	3#6, 1#10G, 1" C	50/3	19 A 20	50/3	—	2.3	SPARE
—	2.3	—	—	21 B 22	—	—	2.3	—
—	2.3	—	—	23 C 24	—	—	2.3	—
SPARE	—	—	50/3	25 A 26	50/3	0	—	—
—	—	—	—	27 B 28	—	—	—	—
—	—	—	—	29 C 30	—	—	—	—
SPARE	—	50/3	31 A 32	50/3	—	—	—	SPARE
—	—	—	—	33 B 34	—	—	—	—
—	—	—	—	35 C 36	—	—	—	—
SPARE	—	50/3	37 A 38	50/3	—	—	—	SPARE
—	—	—	—	39 B 40	—	—	—	—
—	—	—	—	41 C 42	—	—	—	—
CONNECTED			D.F.		DEMAND			
EXISTING LOAD	0.0		x	1.25		0.0	KVA LOAD BALANCE PER PHASE: PHASE A: 100.0% PHASE B: 100.0% PHASE C: 100.0%	
COOLING:	0.0		x	0.00		0.0		
HEATING:	0.0		x	0.00		0.0		
KITCHEN:	0.0		PER NEC 220.56			0.0		
LIGHTING:	0.0		x	1.25		0.0		
MOTORS:	0.0		x	1.00		0.0	HIGHEST PHASE LOAD 153.3 AMPERES	
LARGEST MOTOR	0.0		PER NEC 220.18(A)			0.0		
OTHER:	55.2		x	1.00		55.2		
RECEPTACLES:	0.0		PER NEC 220.44			0.0		
CONNECTED KVA	55.2		DEMAND KVA:			55.2		
AVERAGE CONNECTED AMPS	153.3		DEMAND AMPS:			153.3		

NOTES:

- (1)
- (2)
- (3)
- (4)
- (5)

PANEL: RPP-321 (SECT 2) (EXIST)										
ROOM/LOCATION: NEC										
FED FROM:										
VOLTAGE & PHASE: 208Y-3Ø										
MOUNTING: SURFACE										
A/C RATING: 22KVA/C										
AMPERAGE: 400A										
MAIN: MCB										
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE			BKR	FEEDER SIZE	KVA	DESCRIPTION
CABINET 115.713 07	2.3	3#6, 1#10G, 1°C	50/3	43	A	44	50/3	3#6, 1#10G, 1°C	2.3	CABINET 115.713.08X
—	2.3	—	—	45	B	46	—	—	2.3	—
—	2.3	—	—	47	C	48	—	—	2.3	—
CABINET 115.713.08Y	2.3	3#6, 1#10G, 1°C	50/3	49	A	50	50/3	3#6, 1#10G, 1°C	2.3	CABINET 115.713.09
—	2.3	—	—	51	B	52	—	—	2.3	—
—	2.3	—	—	53	C	54	—	—	2.3	—
CABINET 115.713.10	2.3	3#6, 1#10G, 1°C	50/3	55	A	56	50/3	3#6, 1#10G, 1°C	2.3	CABINET 115.713.11
—	2.3	—	—	57	B	58	—	—	2.3	—
—	2.3	—	—	59	C	60	—	—	2.3	—
CABINET 115.713.12X	2.3	3#6, 1#10G, 1°C	50/3	61	A	62	50/3	3#6, 1#10G, 1°C	0.0	CABINET 115.713.12Y
—	2.3	—	—	63	B	64	—	—	0.0	—
—	2.3	—	—	65	C	66	—	—	0.0	—
SPARE	2.3	0	50/3	67	A	68	20/2	2#12, 1#12G, 1/C	1.7	OBM RECEPTACLE
—	2.3	—	—	69	B	70	—	—	1.7	—
—	2.3	—	—	71	C	72	—	—	1.7	—
SPARE	—	—	50/3	73	A	74	20/2	2#12, 1#12G, 1/C	1.7	OBM RECEPTACLE
—	—	—	—	75	B	76	—	—	1.7	—
—	—	—	—	77	C	78	—	—	1.7	—
SPARE	—	—	50/3	79	A	80	20/2	2#12, 1#12G, 1/C	1.7	OBM RECEPTACLE
—	—	—	—	81	B	82	—	—	1.7	—
—	—	—	—	83	C	84	—	—	1.7	—
CONNECTED			D F			DEMAND				
EXISTING LOAD	0.0			x	1.25		0.0			
COOLING:	0.0			x	0.00		0.0			
HEATING:	0.0			x	0.00		0.0			KVA LOAD BALANCE PER PHASE:
KITCHEN:	0.0			PER NEC 220.56			0.0			PHASE A: 116.9%
LIGHTING:	0.0			x	1.25		0.0			PHASE B: 91.5%
MOTORS:	0.0			x	1.00		0.0			PHASE C: 91.5%
LARGEST MOTOR	0.0			PER NEC 220.18(A)			0.0			
OTHER:	60.3			x	1.00		60.3			HIGHEST PHASE LOAD
RECEPTACLES:	0.0			PER NEC 220.44			0.0			195.8 AMPERES
CONNECTED KVA			60.3	DEMAND KVA:			60.3			
AVERAGE CONNECTED AMPS			167.5	DEMAND AMPS:			195.8			
NOTES:										
(1)-										
(2)-										
(3)-										
(4)-										
(5)-										

RPP A312 (SEC 1) (NEW)	RPP A313 (SEC 1) (NEW)	RPP A321 (SEC 1)
RPP A312 (SEC 2) (NEW)	RPP A313 (SEC 2) (NEW)	RPP A321 (SEC 2)

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FILE LOCATION: \\003015040-NEW Westborough MA UPS Compaq CADWorx Server\4_Electrical\001504001\03001_E007 Panel Schedules.dwg
EDITED BY: M101010101

PANEL: RPP-A322 (SEC1) (EXIST)													
ROOM/LOCATION: NEC													
FED FROM:													
VOLTAGE & PHASE: 208Y—3Ø													
MOUNTING: SURFACE													
AIC RATING: 22kAIC AMPERAGE: 400A MAIN: MCB													
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR
CABINET 115.712.01	2.3	3#6, 1#10G, 1" C	50/3	1 A 2	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.712.02	2.3	3	B 4	—	—
—	2.3	—	—	5 C 6	—	—	2.3	—	2.3	—	—	—	—
—	2.3	—	—	9 B 10	—	—	2.3	—	2.3	—	—	—	—
CABINET 115.712.03	2.3	3#6, 1#10G, 1" C	50/3	7 A 8	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.712.04 X	2.3	11	C 12	—	—
—	2.3	—	—	13 A 14	50/3	3#6, 1#10G, 1" C	2.3	—	2.3	15	B 16	—	—
CABINET 115.712.04 Y	2.3	3#6, 1#10G, 1" C	50/3	13 A 14	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.712.05	2.3	17	C 18	—	—
—	2.3	—	—	19 A 20	50/3	0	—	—	2.3	21	B 22	—	—
CABINET 115.712.06	2.3	3#6, 1#10G, 1" C	50/3	21 B 22	—	—	—	SPARE	—	23	C 24	—	—
—	2.3	—	—	25 A 26	50/3	0	—	—	—	27	B 28	—	—
SPARE	—	—	50/3	29 C 30	—	—	—	SPARE	—	31	A 32	50/3	—
—	—	—	—	33 B 34	—	—	—	—	—	35	C 36	—	—
SPARE	—	—	50/3	37 A 38	50/3	—	—	SPARE	—	39	B 40	—	—
—	—	—	—	41 C 42	—	—	—	—	—	43	C 44	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
CONNECTED	0.0	—	—	D.F.	—	DEMAND	0.0	EXISTING LOAD	0.0	—	—	—	—
COOLING:	0.0	—	—	x 0.00	—	—	0.0	COOLING:	0.0	—	—	—	—
HEATING:	0.0	—	—	x 0.00	—	—	0.0	HEATING:	0.0	—	—	—	—
KITCHEN:	0.0	—	—	PER NEC 220.56	—	—	0.0	KITCHEN:	0.0	—	—	—	—
LIGHTING:	0.0	—	—	x 1.25	—	—	0.0	LIGHTING:	0.0	—	—	—	—
MOTORS:	0.0	—	—	x 1.00	—	—	0.0	MOTORS:	0.0	—	—	—	—
LARGEST MOTOR	0.0	—	—	PER NEC 220.18(A)	—	—	0.0	LARGEST MOTOR	0.0	—	—	—	—
OTHER:	48.3	—	—	x 1.00	—	—	48.3	OTHER:	48.3	—	—	—	—
RECEPTACLES:	0.0	—	—	PER NEC 220.44	—	—	0.0	RECEPTACLES:	0.0	—	—	—	—
CONNECTED KVA	48.3	—	—	DEMAND KVA:	—	—	48.3	CONNECTED KVA	48.3	—	—	—	—
AVERAGE CONNECTED AMPS	134.2	—	—	DEMAND AMPS:	—	—	134.2	AVERAGE CONNECTED AMPS	134.2	—	—	—	—
NOTES:													
(1)-													
(2)-													
(3)-													
(4)-													
(5)-													

PANEL: RPP-B112 (SECT 1) (EXIST)													
ROOM/LOCATION: NEC													
FED FROM: PANEL PDU-B1													
VOLTAGE & PHASE: 277/480Y—3Ø													
MOUNTING: SURFACE													
AIC RATING: 22kAIC AMPERAGE: 400A MAIN: MCB													
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR
CABINET #1	2.3	3#6, 1#10G, 1" C	50/3	1 A 2	50/3	3#6, 1#10G, 1" C	2.3	CABINET #2	2.3	3	B 4	—	—
—	2.3	—	—	5 C 6	—	—	2.3	—	2.3	—	—	—	—
—	2.3	—	—	9 B 10	—	—	2.3	—	2.3	—	—	—	—
CABINET #3	2.3	3#6, 1#10G, 1" C	50/3	7 A 8	50/3	3#6, 1#10G, 1" C	2.3	CABINET #4	2.3	11	C 12	—	—
—	2.3	—	—	13 A 14	50/3	3#6, 1#10G, 1" C	2.3	—	2.3	15	B 16	—	—
CABINET #5	2.3	3#6, 1#10G, 1" C	50/3	13 A 14	50/3	3#6, 1#10G, 1" C	2.3	CABINET #6	2.3	17	C 18	—	—
—	2.3	—	—	19 A 20	50/3	0	—	—	2.3	21	B 22	—	—
CABINET #7	2.3	3#6, 1#10G, 1" C	50/3	21 B 22	—	—	—	SPARE	—	23	C 24	—	—
—	2.3	—	—	25 A 26	50/3	0	—	—	—	27	B 28	—	—
SPARE	—	—	50/3	29 C 30	—	—	—	SPARE	—	31	A 32	50/3	—
—	—	—	—	33 B 34	—	—	—	—	—	35	C 36	—	—
SPARE	—	—	50/3	37 A 38	50/3	—	—	SPARE	—	39	B 40	—	—
—	—	—	—	41 C 42	—	—	—	—	—	43	C 44	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
CONNECTED	0.0	—	—	D.F.	—	DEMAND	0.0	EXISTING LOAD	0.0	—	—	—	—
COOLING:	0.0	—	—	x 0.00	—	—	0.0	COOLING:	0.0	—	—	—	—
HEATING:	0.0	—	—	x 0.00	—	—	0.0	HEATING:	0.0	—	—	—	—
KITCHEN:	0.0	—	—	PER NEC 220.56	—	—	0.0	KITCHEN:	0.0	—	—	—	—
LIGHTING:	0.0	—	—	x 1.25	—	—	0.0	LIGHTING:	0.0	—	—	—	—
MOTORS:	0.0	—	—	x 1.00	—	—	0.0	MOTORS:	0.0	—	—	—	—
LARGEST MOTOR	0.0	—	—	PER NEC 220.18(A)	—	—	0.0	LARGEST MOTOR	0.0	—	—	—	—
OTHER:	48.3	—	—	x 1.00	—	—	48.3	OTHER:	48.3	—	—	—	—
RECEPTACLES:	0.0	—	—	PER NEC 220.44	—	—	0.0	RECEPTACLES:	0.0	—	—	—	—
CONNECTED KVA	48.3	—	—	DEMAND KVA:	—	—	48.3	CONNECTED KVA	48.3	—	—	—	—
AVERAGE CONNECTED AMPS	58.1	—	—	DEMAND AMPS:	—	—	58.1	AVERAGE CONNECTED AMPS	58.1	—	—	—	—
NOTES:													
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(3)-													
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PANEL: RPP-B113 (SEC 1)													
ROOM/LOCATION: NEC													
FED FROM: PDU B1 (EXIST)													
AIC RATING: 22kAIC													
VOLTAGE & PHASE: 208Y—3Ø													
AMPERAGE: 400A													
MOUNTING: SURFACE													
MAIN: MCB													
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR
CABINET 115.703.01	2.3	3#6, 1#10G, 1" C	50/3	1 A 2	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.703.02	2.3	3 B 4	—	—	—
—	2.3	—	—	5 C 6	—	—	—	—	2.3	—	—	—	—
—	2.3	—	—	9 B 10	—	—	—	—	2.3	—	—	—	—
CABINET 115.703.03	2.3	3#6, 1#10G, 1" C	50/3	7 A 8	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.703.04 X	2.3	11 C 12	—	—	—
—	2.3	—	—	13 A 14	50/3	3#6, 1#10G, 1" C	2.3	—	2.3	15 B 16	—	—	—
CABINET 115.703.04 Y	2.3	3#6, 1#10G, 1" C	50/3	13 A 14	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.703.05	2.3	17 C 18	—	—	—
—	2.3	—	—	19 A 20	50/3	—	—	—	2.3	21 B 22	—	—	—
CABINET 115.703.06	2.3	3#6, 1#10G, 1" C	50/3	21 B 22	—	—	—	SPARE	—	23 C 24	—	—	—
—	2.3	—	—	25 A 26	50/3	0	—	—	2.3	—	—	—	—
—	2.3	—	—	27 B 28	—	—	—	SPARE	—	29 C 30	—	—	—
SPARE	—	—	50/3	31 A 32	50/3	—	—	—	—	33 B 34	—	—	—
—	—	—	—	35 C 36	—	—	—	SPARE	—	37 A 38	50/3	—	—
—	—	—	—	39 B 40	—	—	—	—	—	41 C 42	—	—	—
SPARE	—	—	50/3	37 A 38	50/3	—	—	SPARE	—	—	—	—	—
—	—	—	—	39 B 40	—	—	—	—	—	—	—	—	—
—	—	—	—	41 C 42	—	—	—	—	—	—	—	—	—
CONNECTED D.F. DEMAND													
EXISTING LOAD	0.0		x 1.25			0.0							
COOLING:	0.0		x 0.00			0.0							
HEATING:	0.0		x 0.00			0.0							
KITCHEN:	0.0		PER NEC 220.56			0.0							
LIGHTING:	0.0		x 1.25			0.0							
MOTORS:	0.0		x 1.00			0.0							
LARGEST MOTOR	0.0		PER NEC 220.18(A)			0.0							
OTHER:	55.2		x 1.00			55.2							
RECEPTACLES:	0.0		PER NEC 220.44			0.0							
HIGHEST PHASE LOAD													
153.3 AMPERES													
CONNECTED KVA 55.2 DEMAND KVA: 55.2													
AVERAGE CONNECTED AMPS 153.3 DEMAND AMPS: 153.3													
NOTES:													
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PANEL: RPP-B214 (SEC 1)										
ROOM/LOCATION: NEC										
FED FROM: PDU B2 (EXIST)										
VOLTAGE & PHASE: 208Y—3Ø										
MOUNTING: SURFACE										
A/C RATING: 22kAIC										
AMPERAGE: 400A										
MAIN: MCB										
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE			BKR	FEEDER SIZE	KVA	DESCRIPTION
CABINET 115.705.01	2.3	3#6, 1#10G, 1" C	50/3	1	A	2	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.705.02
--	2.3	--	--	3	B	4	--	--	2.3	--
--	2.3	--	--	5	C	6	--	--	2.3	--
CABINET 115.705.03	2.3	3#6, 1#10G, 1" C	50/3	7	A	8	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.705.04 X
--	2.3	--	--	9	B	10	--	--	2.3	--
--	2.3	--	--	11	C	12	--	--	2.3	--
CABINET 115.705.04 Y	2.3	3#6, 1#10G, 1" C	50/3	13	A	14	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.705.05
--	2.3	--	--	15	B	16	--	--	2.3	--
--	2.3	--	--	17	C	18	--	--	2.3	--
CABINET 115.705.06	2.3	3#6, 1#10G, 1" C	50/3	19	A	20	50/3	--	2.3	SPARE
--	2.3	--	--	21	B	22	--	--	2.3	--
--	2.3	--	--	23	C	24	--	--	2.3	--
SPARE	--	--	50/3	25	A	26	50/3	0	--	SPARE
--	--	--	--	27	B	28	--	--	--	--
--	--	--	--	29	C	30	--	--	--	--
SPARE	--	--	50/3	31	A	32	50/3	--	--	SPARE
--	--	--	--	33	B	34	--	--	--	--
--	--	--	--	35	C	36	--	--	--	--
SPARE	--	--	50/3	37	A	38	50/3	--	--	SPARE
--	--	--	--	39	B	40	--	--	--	--
--	--	--	--	41	C	42	--	--	--	--
CONNECTED				D.F			DEMAND			
EXISTING LOAD	0.0			x	1.25				0.0	
COOLING:	0.0			x	0.00				0.0	
HEATING:	0.0			x	0.00				0.0	KVA LOAD BALANCE PER PHASE:
KITCHEN:	0.0			PER NEC	220.56				0.0	PHASE A: 100.0%
LIGHTING:	0.0			x	1.25				0.0	PHASE B: 100.0%
MOTORS:	0.0			x	1.00				0.0	PHASE C: 100.0%
LARGEST MOTOR	0.0			PER NEC	220.18(A)				0.0	
OTHER:	55.2			x	1.00				55.2	HIGHEST PHASE LOAD
RECEPTACLES:	0.0			PER NEC	220.44				0.0	153.3 AMPERES
CONNECTED KVA	55.2			DEMAND KVA:				55.2		
AVERAGE CONNECTED AMPS	153.3			DEMAND AMPS:				153.3		
NOTES:										
(1)-										
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PANEL : RPP-B114 (SECT 2)												
ROOM/LOCATION: NEC												
FED FROM: PDU-B1 (EXIST)						AIC RATING: 22kAIC						
VOLTAGE & PHASE: 208Y-3Ø						AMPERAGE: 400A						
MOUNTING: SURFACE						MAIN: MCB						
DESCRIPTION		KVA	FEEDER SIZE		BKR	PHASE		BKR	FEEDER SIZE		KVA	DESCRIPTION
CABINET 115.704.07		2.3	3#6, 1#10G, 1"C		50/3	43	A 44	50/3	3#6, 1#10G, 1"C		2.3	CABINET 115.704.08X
		2.3	--		--	45	B 46	--	--		2.3	
		2.3	--		--	47	C 48	--	--		2.3	
CABINET 115.704.08Y		2.3	3#6, 1#10G, 1"C		50/3	49	A 50	50/3	3#6, 1#10G, 1"C		2.3	CABINET 115.704.09
		2.3	--		--	51	B 52	--	--		2.3	
		2.3	--		--	53	C 54	--	--		2.3	
CABINET 115.704.10		2.3	3#6, 1#10G, 1"C		50/3	55	A 56	50/3	3#6, 1#10G, 1"C		2.3	CABINET 115.704.11
		2.3	--		--	57	B 58	--	--		2.3	
		2.3	--		--	59	C 60	--	--		2.3	
CABINET 115.704.12X		2.3	3#6, 1#10G, 1"C		50/3	61	A 62	50/3	3#6, 1#10G, 1"C		2.3	CABINET 115.704.12Y
		2.3	--		--	63	B 64	--	--		2.3	
		2.3	--		--	65	C 66	--	--		2.3	
SPARE		2.3	0		50/3	67	A 68	20/2	2#12, 1#12G, 1/C"		1.7	OBM RECEPTACLE
		2.3	--		--	69	B 70	--	--		1.7	
		2.3	--		--	71	C 72	--	--		1.7	
SPARE		--	--		50/3	73	A 74	20/2	2#12, 1#12G, 1/C"		1.7	OBM RECEPTACLE
		--	--		--	75	B 76	--	--		1.7	
		--	--		--	77	C 78	--	--		1.7	
SPARE		--	--		50/3	79	A 80	20/2	2#12, 1#12G, 1/C"		1.7	OBM RECEPTACLE
		--	--		--	81	B 82	--	--		1.7	
		--	--		--	83	C 84	--	--		1.7	
		CONNECTED			D.F.			DEMAND				
EXISTING LOAD		0.0			x 1.25			0.0				
COOLING:		0.0			x 0.00			0.0				
HEATING:		0.0			x 0.00			0.0			KVA LOAD BALANCE PER PHASE:	
KITCHEN:		0.0			PER NEC 220.56			0.0			PHASE A: 115.2%	
LIGHTING:		0.0			x 1.25			0.0			PHASE B: 92.4%	
MOTORS:		0.0			x 1.00			0.0			PHASE C: 92.4%	
(LARGEST MOTOR		0.0			PER NEC 220.18(A)			0.0				
OTHER:		67.2			x 1.00			67.2			HIGHEST PHASE LOAD	
RECEPTACLES:		0.0			PER NEC 220.44			0.0			215.0 AMPERES	
CONNECTED KVA		67.2			DEMAND KVA:			67.2				
AVERAGE CONNECTED AMPS		186.7			DEMAND AMPS:			215.0				
NOTES:												
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PANEL: RPP-B213 (SECT 2)														
ROOM/LOCATION: NEC						AIC RATING: 22kAIC								
FED FROM: PDU-B2 (EXIST)						AMPERAGE: 400A								
VOLTAGE & PHASE: 208Y-3Ø						MAIN: MCB								
MOUNTING: SURFACE														
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE		BKR	FEEDER SIZE	KVA	DESCRIPTION					
CABINET 115.706.07	2.3	3#6, 1#10G, 1" C	50/3	43	A 44	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.706.08X					
--	2.3	--	--	45	B 46	--	--	2.3	--					
--	2.3	--	--	47	C 48	--	--	2.3	--					
CABINET 115.706.08Y	2.3	3#6, 1#10G, 1" C	50/3	49	A 50	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.706.09					
--	2.3	--	--	51	B 52	--	--	2.3	--					
--	2.3	--	--	53	C 54	--	--	2.3	--					
CABINET 115.706.10	2.3	3#6, 1#10G, 1" C	50/3	55	A 56	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.706.11					
--	2.3	--	--	57	B 58	--	--	2.3	--					
--	2.3	--	--	59	C 60	--	--	2.3	--					
CABINET 115.706.12X	2.3	3#6, 1#10G, 1" C	50/3	61	A 62	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.706.12Y					
--	2.3	--	--	63	B 64	--	--	2.3	--					
--	2.3	--	--	65	C 66	--	--	2.3	--					
SPARE	2.3	0	50/3	67	A 68	20/2	2#12, 1#12G, 1" C	1.7	OBM RECEPTACLE					
--	2.3	--	--	69	B 70	--	--	1.7	--					
--	2.3	--	--	71	C 72	--	--	1.7	--					
SPARE	--	--	50/3	73	A 74	20/2	2#12, 1#12G, 1" C	1.7	OBM RECEPTACLE					
--	--	--	--	75	B 76	--	--	1.7	--					
--	--	--	--	77	C 78	--	--	1.7	--					
SPARE	--	--	50/3	79	A 80	20/2	2#12, 1#12G, 1" C	1.7	OBM RECEPTACLE					
--	--	--	--	81	B 82	--	--	1.7	--					
--	--	--	--	83	C 84	--	--	1.7	--					
CONNECTED				D.F.		DEMAND								
EXISTING LOAD	0.0		x	1.25		0.0		KVA LOAD BALANCE PER PHASE: PHASE A: 115.2% PHASE B: 92.4% PHASE C: 92.4%						
COOLING:	0.0		x	0.00		0.0								
HEATING:	0.0		x	0.00		0.0								
KITCHEN:	0.0		PER NEC 220.56			0.0								
WASHING:	0.0		x	1.25		0.0								
MOTORS:	0.0		x	1.00		0.0		HIGHEST PHASE LOAD 215.0 AMPERES						
LARGEST MOTOR	0.0		PER NEC 220.18(A)			0.0								
OTHER:	67.2		x	1.00		67.2								
RECEPTACLES:	0.0		PER NEC 220.44			0.0								
CONNECTED KVA		67.2			DEMAND KVA:		67.2							
AVERAGE CONNECTED AMPS		186.7			DEMAND AMPS:		215.0							
NOTES:														
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verizon[✓]

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WESTBOROUGH MEC PHASE 2
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581

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NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

PROJECT NO:	2007132400	STAMP
CAD DWG FILE:	2001132400	
DESIGNED BY:	RN	
DRAWN BY:	RN	
CHECKED BY:	BK	
COPYRIGHT:	MARCH 2015	
		05-29-2020

PANEL
SCHEDULES

E608

RPP B114 (SEC 1) (NEW)	RPP B213 (SEC 1) (NEW)	RPP B214 (SEC 1) (NEW)
RPP B114 (SEC 2) (NEW)	RPP B112 (SEC 2) (NEW)	RPP B113 (SEC 2) (NEW)

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PANEL: RPP-B311 (SEC 1)													
ROOM/LOCATION: NEC							AIC RATING: 22kAIC						
FED FROM: PDU B3							AMPERAGE: 400A						
VOLTAGE & PHASE: 208Y—3Ø							MAIN: MCB						
MOUNTING: SURFACE													
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE		BKR	FEEDER SIZE	KVA	DESCRIPTION				
CABINET 115.711.01	2.3	3#6, 1#10G, 1"C	50/3	1	A	2	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.711.02			
—	2.3	—	—	3	B	4	—	—	2.3	—			
—	2.3	—	—	5	C	6	—	—	2.3	—			
CABINET 115.711.03	2.3	3#6, 1#10G, 1"C	50/3	7	A	8	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.711.04 X			
—	2.3	—	—	9	B	10	—	—	2.3	—			
—	2.3	—	—	11	C	12	—	—	2.3	—			
CABINET 115.711.04 Y	2.3	3#6, 1#10G, 1"C	50/3	13	A	14	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.711.05			
—	2.3	—	—	15	B	16	—	—	2.3	—			
—	2.3	—	—	17	C	18	—	—	2.3	—			
CABINET 115.711.06	2.3	3#6, 1#10G, 1"C	50/3	19	A	20	50/3	—	2.3	SPARE			
—	2.3	—	—	21	B	22	—	—	2.3	—			
—	2.3	—	—	23	C	24	—	—	2.3	—			
SPARE	—	—	50/3	25	A	26	50/3	0	—	SPARE			
—	—	—	—	27	B	28	—	—	—	—			
—	—	—	—	29	C	30	—	—	—	—			
SPARE	—	—	50/3	31	A	32	50/3	—	—	SPARE			
—	—	—	—	33	B	34	—	—	—	—			
—	—	—	—	35	C	36	—	—	—	—			
SPARE	—	—	50/3	37	A	38	50/3	—	—	SPARE			
—	—	—	—	39	B	40	—	—	—	—			
—	—	—	—	41	C	42	—	—	—	—			
CONNECTED			D.F.			DEMAND							
EXISTING LOAD	0.0		x	1.25		0.0		KVA LOAD BALANCE PER PHASE: PHASE A: 100.0% PHASE B: 100.0% PHASE C: 100.0%					
COOLING:	0.0		x	0.00		0.0							
HEATING:	0.0		x	0.00		0.0							
KITCHEN:	0.0		PER NEC 220.56			0.0							
LIGHTING:	0.0		x	1.25		0.0							
MOTORS:	0.0		x	1.00		0.0							
LARGEST MOTOR	0.0		PER NEC 220.18(A)			0.0							
OTHER:	55.2		x	1.00		55.2	HIGHEST PHASE LOAD 153.3 AMPERES						
RECEPTACLES:	0.0		PER NEC 220.44			0.0							
CONNECTED KVA		55.2			DEMAND KVA:		55.2						
AVERAGE CONNECTED AMPS		153.3			DEMAND AMPS:		153.3						
NOTES:													
(1)-													
(2)-													
(3)-													
(4)-													
(5)-													

PANEL: RPP-B312 (SEC 1)													
ROOM/LOCATION: NEC							AIC RATING: 22kAIC						
FED FROM: PDU B3							AMPERAGE: 400A						
VOLTAGE & PHASE: 208Y—3Ø							MAIN: MCB						
MOUNTING: SURFACE													
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION					
CABINET 115.710.01	2.3	3#6, 1#10G, 1" C	50/3	1 A 2	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.710.02					
—	2.3	—	—	3 B 4	—	—	2.3	—					
—	2.3	—	—	5 C 6	—	—	2.3	—					
CABINET 115.710.03	2.3	3#6, 1#10G, 1" C	50/3	7 A 8	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.710.04 X					
—	2.3	—	—	9 B 10	—	—	2.3	—					
—	2.3	—	—	11 C 12	—	—	2.3	—					
CABINET 115.710.04 Y	2.3	3#6, 1#10G, 1" C	50/3	13 A 14	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.710.05					
—	2.3	—	—	15 B 16	—	—	2.3	—					
—	2.3	—	—	17 C 18	—	—	2.3	—					
CABINET 115.710.06	2.3	3#6, 1#10G, 1" C	50/3	19 A 20	50/3	—	2.3	SPARE					
—	2.3	—	—	21 B 22	—	—	2.3	—					
—	2.3	—	—	23 C 24	—	—	2.3	—					
SPARE	—	—	50/3	25 A 26	50/3	0	—	SPARE					
—	—	—	—	27 B 28	—	—	—	—					
—	—	—	—	29 C 30	—	—	—	—					
SPARE	—	—	50/3	31 A 32	50/3	—	—	SPARE					
—	—	—	—	33 B 34	—	—	—	—					
—	—	—	—	35 C 36	—	—	—	—					
SPARE	—	—	50/3	37 A 38	50/3	—	—	SPARE					
—	—	—	—	39 B 40	—	—	—	—					
—	—	—	—	41 C 42	—	—	—	—					
CONNECTED							D.F. DEMAND						
EXISTING LOAD	0.0		x	1.25		0.0							
COOLING:	0.0		x	0.00		0.0							
HEATING:	0.0		x	0.00		0.0							
KITCHEN:	0.0		PER NEC 220.56			0.0							
LIGHTING:	0.0		x	1.25		0.0							
MOTORS:	0.0		x	1.00		0.0							
LARGEST MOTOR	0.0		PER NEC 220.18(A)			0.0							
OTHER:	55.2		x	1.00		55.2							
RECEPTACLES:	0.0		PER NEC 220.44			0.0							
CONNECTED KVA							DEMAND KVA:						
AVERAGE CONNECTED AMPS							DEMAND AMPS:						
NOTES:													
(1)-													
(2)-													
(3)-													
(4)-													
(5)-													

PANEL: RPP-B313 (SEC 1)													
ROOM/LOCATION: NEC							AIC RATING: 22kAIC						
FED FROM: PDU B3							AMPERAGE: 400A						
VOLTAGE & PHASE: 208Y—3Ø							MAIN: MCB						
MOUNTING: SURFACE													
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION					
CABINET 115.709.01	2.3	3#6, 1#10G, 1"C	50/3	1 A 2	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.709.02					
—	2.3	—	—	3 B 4	—	—	2.3	—					
—	2.3	—	—	5 C 6	—	—	2.3	—					
CABINET 115.709.03	2.3	3#6, 1#10G, 1"C	50/3	7 A 8	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.709.04 X					
—	2.3	—	—	9 B 10	—	—	2.3	—					
—	2.3	—	—	11 C 12	—	—	2.3	—					
CABINET 115.709.04 Y	2.3	3#6, 1#10G, 1"C	50/3	13 A 14	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.709.05					
—	2.3	—	—	15 B 16	—	—	2.3	—					
—	2.3	—	—	17 C 18	—	—	2.3	—					
CABINET 115.709.06	2.3	3#6, 1#10G, 1"C	50/3	19 A 20	50/3	—	2.3	SPARE					
—	2.3	—	—	21 B 22	—	—	2.3	—					
—	2.3	—	—	23 C 24	—	—	2.3	—					
SPARE	—	—	50/3	25 A 26	50/3	0	—	SPARE					
—	—	—	—	27 B 28	—	—	—	—					
—	—	—	—	29 C 30	—	—	—	—					
SPARE	—	—	50/3	31 A 32	50/3	—	—	SPARE					
—	—	—	—	33 B 34	—	—	—	—					
—	—	—	—	35 C 36	—	—	—	—					
SPARE	—	—	50/3	37 A 38	50/3	—	—	SPARE					
—	—	—	—	39 B 40	—	—	—	—					
—	—	—	—	41 C 42	—	—	—	—					
CONNECTED			D.F.			DEMAND							
EXISTING LOAD	0.0			x	1.25			0.0	KVA LOAD BALANCE PER PHASE: PHASE A: 100.0% PHASE B: 100.0% PHASE C: 100.0%				
COOLING:	0.0			x	0.00			0.0					
HEATING:	0.0			x	0.00			0.0					
KITCHEN:	0.0			PER NEC 220.56			0.0						
LIGHTING:	0.0			x	1.25			0.0					
MOTORS:	0.0			x	1.00			0.0					
LARGEST MOTOR	0.0			PER NEC 220.18(A)			0.0						
OTHER:	55.2			x	1.00	55.2		HIGHEST PHASE LOAD					
RECEPTACLES:	0.0			PER NEC 220.44			0.0	153.3 AMPERES					
CONNECTED KVA		55.2	DEMAND KVA:				55.2						
AVERAGE CONNECTED AMPS		153.3	DEMAND AMPS:				153.3						
NOTES:													
(1)													
(2)													
(3)													
(4)													
(5)													

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PANEL: RPP-B321 (SEC1) (EXIST)											
ROOM/LOCATION: NEC						AIC RATING: 22kAIC					
FED FROM:						AMPERAGE: 400A					
VOLTAGE & PHASE: 208Y—3Ø						MAIN: MCB / Top Fed					
MOUNTING: SURFACE						MAIN: MCB					
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION	KVA	FEEDER SIZE	BKR
CABINET 115.713.01	2.3	3#6, 1#10G, 1"C	50/3	1 A 2	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.713.02	2.3	3#6, 1#10G, 1"C	50/3
—	2.3	—	—	3 B 4	—	—	2.3	—	2.3	—	—
—	2.3	—	—	5 C 6	—	—	2.3	—	2.3	—	—
CABINET 115.713.03	2.3	3#6, 1#10G, 1"C	50/3	7 A 8	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.713.04 X	2.3	3#6, 1#10G, 1"C	50/3
—	2.3	—	—	9 B 10	—	—	2.3	—	2.3	—	—
—	2.3	—	—	11 C 12	—	—	2.3	—	2.3	—	—
CABINET 115.713.04 Y	2.3	3#6, 1#10G, 1"C	50/3	13 A 14	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.713.05	2.3	3#6, 1#10G, 1"C	50/3
—	2.3	—	—	15 B 16	—	—	2.3	—	2.3	—	—
—	2.3	—	—	17 C 18	—	—	2.3	—	2.3	—	—
CABINET 115.713.06	2.3	3#6, 1#10G, 1"C	50/3	19 A 20	50/3	—	2.3	SPARE	2.3	—	—
—	2.3	—	—	21 B 22	—	—	2.3	—	2.3	—	—
—	2.3	—	—	23 C 24	—	—	2.3	—	2.3	—	—
SPARE	—	—	50/3	25 A 26	50/3	0	—	SPARE	—	—	—
—	—	—	—	27 B 28	—	—	—	—	—	—	—
—	—	—	—	29 C 30	—	—	—	—	—	—	—
SPARE	—	—	50/3	31 A 32	50/3	—	—	SPARE	—	—	—
—	—	—	—	33 B 34	—	—	—	—	—	—	—
—	—	—	—	35 C 36	—	—	—	—	—	—	—
SPARE	—	—	50/3	37 A 38	50/3	—	—	SPARE	—	—	—
—	—	—	—	39 B 40	—	—	—	—	—	—	—
—	—	—	—	41 C 42	—	—	—	—	—	—	—
D.F. DEMAND											
EXISTING LOAD	0.0		x	1.25		0.0					
COOLING:	0.0		x	0.00		0.0					
HEATING:	0.0		x	0.00		0.0					
KITCHEN:	0.0		PER NEC 220.56		0.0						
LIGHTING:	0.0		x	1.25		0.0					
MOTORS:	0.0		x	1.00		0.0					
LARGEST MOTOR	0.0		PER NEC 220.18(A)		0.0						
OTHER:	55.2		x	1.00		55.2					
RECEPTACLES:	0.0		PER NEC 220.44		0.0						
CONNECTED KVA	55.2		DEMAND KVA:	55.2							
AVERAGE CONNECTED AMPS	153.3		DEMAND AMPS:	153.3							
KVA LOAD BALANCE PER PHASE:											
PHASE A: 100.0%											
PHASE B: 100.0%											
PHASE C: 100.0%											
HIGHEST PHASE LOAD											
153.3 AMPERES											
NOTES:											
(1)-											
(2)-											
(3)-											
(4)-											
(5)-											

PANEL: RPP-B321 (SECT 2) (EXIST)											
ROOM/LOCATION: NEC						AIC RATING: 22kAIC					
FED FROM:						AMPERAGE: 400A					
VOLTAGE & PHASE: 208Y—3Ø						MAIN: MCB					
MOUNTING: SURFACE						MAIN: MCB					
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION	KVA	FEEDER SIZE	BKR
CABINET 115.713.07	2.3	3#6, 1#10G, 1"C	50/3	43 A 44	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.713.08X	2.3	3#6, 1#10G, 1"C	50/3
—	2.3	—	—	45 B 46	—	—	2.3	—	2.3	—	—
—	2.3	—	—	47 C 48	—	—	2.3	—	2.3	—	—
CABINET 115.713.08Y	2.3	3#6, 1#10G, 1"C	50/3	49 A 50	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.713.09	2.3	3#6, 1#10G, 1"C	50/3
—	2.3	—	—	51 B 52	—	—	2.3	—	2.3	—	—
—	2.3	—	—	53 C 54	—	—	2.3	—	2.3	—	—
CABINET 115.713.10	2.3	3#6, 1#10G, 1"C	50/3	55 A 56	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.713.11	2.3	3#6, 1#10G, 1"C	50/3
—	2.3	—	—	57 B 58	—	—	2.3	—	2.3	—	—
—	2.3	—	—	59 C 60	—	—	2.3	—	2.3	—	—
CABINET 115.713.12X	2.3	3#6, 1#10G, 1"C	50/3	61 A 62	50/3	3#6, 1#10G, 1"C	2.3	CABINET 115.713.12Y	2.3	3#6, 1#10G, 1"C	50/3
—	2.3	—	—	63 B 64	—	—	2.3	—	2.3	—	—
—	2.3	—	—	65 C 66	—	—	2.3	—	2.3	—	—
SPARE	2.3	0	50/3	67 A 68	20/2	2#12, 1#12G, 1/C"	1.7	OBM RECEPTACLE	1.7	—	—
—	2.3	—	—	69 B 70	—	—	1.7	—	1.7	—	—
—	2.3	—	—	71 C 72	—	—	1.7	—	1.7	—	—
SPARE	—	—	50/3	73 A 74	20/2	2#12, 1#12G, 1/C"	1.7	OBM RECEPTACLE	1.7	—	—
—	—	—	—	75 B 76	—	—	1.7	—	1.7	—	—
—	—	—	—	77 C 78	—	—	1.7	—	1.7	—	—
SPARE	—	—	50/3	79 A 80	20/2	2#12, 1#12G, 1/C"	1.7	OBM RECEPTACLE	1.7	—	—
—	—	—	—	81 B 82	—	—	1.7	—	1.7	—	—
—	—	—	—	83 C 84	—	—	1.7	—	1.7	—	—
D.F. DEMAND											
EXISTING LOAD	0.0		x	1.25		0.0					
COOLING:	0.0		x	0.00		0.0					
HEATING:	0.0		x	0.00		0.0					
KITCHEN:	0.0		PER NEC 220.56		0.0						
LIGHTING:	0.0		x	1.25		0.0					
MOTORS:	0.0		x	1.00		0.0					
LARGEST MOTOR	0.0		PER NEC 220.18(A)		0.0						
OTHER:	67.2		x	1.00		67.2					
RECEPTACLES:	0.0		PER NEC 220.44		0.0						
CONNECTED KVA	67.2		DEMAND KVA:	67.2							
AVERAGE CONNECTED AMPS	186.7		DEMAND AMPS:	215.0							
KVA LOAD BALANCE PER PHASE:											
PHASE A: 115.2%											
PHASE B: 92.4%											
PHASE C: 92.4%											
HIGHEST PHASE LOAD											
215.0 AMPERES											
NOTES:											
(1)-											
(2)-											
(3)-											
(4)-											
(5)-											

PANEL: RPP-B322(SEC 1) (EXIST)											
ROOM/LOCATION: NEC						AIC RATING: 22kAIC					
FED FROM:						AMPERAGE: 400A					
VOLTAGE & PHASE: 208Y—3Ø						MAIN: MCB					
MOUNTING: SURFACE											
DESCRIPTION	KVA	FEEDER SIZE	BKR	PHASE	BKR	FEEDER SIZE	KVA	DESCRIPTION	KVA	FEEDER SIZE	BKR
CABINET 115.712.01	2.3	3#6, 1#10G, 1" C	50/3	1 A 2	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.712.02	2.3	3#6, 1#10G, 1" C	50/3
	2.3	—	—	3 B 4	—	—	2.3		2.3	—	—
	2.3	—	—	5 C 6	—	—	2.3		2.3	—	—
CABINET 115.712.03	2.3	3#6, 1#10G, 1" C	50/3	7 A 8	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.712.04 X	2.3	3#6, 1#10G, 1" C	50/3
	2.3	—	—	9 B 10	—	—	2.3		2.3	—	—
	2.3	—	—	11 C 12	—	—	2.3		2.3	—	—
CABINET 115.712.04 Y	2.3	3#6, 1#10G, 1" C	50/3	13 A 14	50/3	3#6, 1#10G, 1" C	2.3	CABINET 115.712.05	2.3	3#6, 1#10G, 1" C	50/3
	2.3	—	—	15 B 16	—	—	2.3		2.3	—	—
	2.3	—	—	17 C 18	—	—	2.3		2.3	—	—
CABINET 115.712.06	2.3	3#6, 1#10G, 1" C	50/3	19 A 20	50/3	0		SPARE			
	2.3	—	—	21 B 22	—	—					
	2.3	—	—	23 C 24	—	—					
SPARE		—	50/3	25 A 26	50/3	0		SPARE			
		—	—	27 B 28	—	—					
		—	—	29 C 30	—	—					
SPARE		—	50/3	31 A 32	50/3			SPARE			
		—	—	33 B 34	—	—					
		—	—	35 C 36	—	—					
SPARE		—	50/3	37 A 38	50/3			SPARE			
		—	—	39 B 40	—	—					
		—	—	41 C 42	—	—					
CONNECTED			D.F.			DEMAND					
EXISTING LOAD	0.0		x	1.25		0.0		KVA LOAD BALANCE PER PHASE: PHASE A: 100.0% PHASE B: 100.0% PHASE C: 100.0%			
COOLING:	0.0		x	0.00		0.0					
HEATING:	0.0		x	0.00		0.0					
KITCHEN:	0.0		PER NEC 220.56			0.0					
LIGHTING:	0.0		x	1.25		0.0					
MOTORS:	0.0		x	1.00		0.0					
LARGEST MOTOR	0.0		PER NEC 220.18(A)			0.0					
OTHER:	48.3		x	1.00		48.3		HIGHEST PHASE LOAD			
RECEPTACLES:	0.0		PER NEC 220.44			0.0		134.2 AMPERES			
CONNECTED KVA		48.3				DEMAND KVA:	48.3				
AVERAGE CONNECTED AMPS		134.2				DEMAND AMPS:	134.2				
NOTES:											
(1):											
(2):											
(3):											
(4):											
(5):											

CU FEEDER SCHEDULE 3G - THWN-2						
CODE	SETS	PHASE	NEUTRAL	GROUND	CONDUIT	AMPACITY
20-3G	1	3 # 12	-	1 # 12	1/2"	20
30-3G	1	3 # 10	-	1 # 10	3/4"	30
40-3G	1	3 # 8	-	1 # 10	3/4"	40
50-3G	1	3 # 6	-	1 # 10	3/4"	55
70-3G	1	3 # 4	-	1 # 8	1"	70
80-3G	1	3 # 3	-	1 # 8	1"	85
100-3G	1	3 # 2	-	1 # 8	1-1/4"	100
125-3G	1	3 # 1	-	1 # 6	1-1/4"	130
150-3G	1	3 # 1/0	-	1 # 6	1-1/2"	150
175-3G	1	3 # 2/0	-	1 # 6	1-1/2"	175
200-3G	1	3 # 3/0	-	1 # 6	2"	200
225-3G	1	3 # 4/0	-	1 # 4	2"	230
250-3G	1	3 # 250 KCMIL	-	1 # 4	2"	255
300-3G	1	3 # 350 KCMIL	-	1 # 3	2-1/2"	310
350-3G	1	3 # 500 KCMIL	-	1 # 3	3"	380
400-3G	1	3 # 600 KCMIL	-	1 # 3	3-1/2"	420
400B-3G	2	3 # 3/0	-	1 # 3	2-1/2"	400
450-3G	2	3 # 4/0	-	1 # 2	2"	450
500-3G	2	3 # 250 KCMIL	-	1 # 2	2-1/2"	510
600-3G	2	3 # 350 KCMIL	-	1 # 1/0	3"	620
800-3G	2	3 # 600 KCMIL	-	1 # 1/0	3-1/2"	840
900-3G	3	3 # 500 KCMIL	-	1 # 2/0	3"	930
1000-3G	3	3 # 400 KCMIL	-	1 # 2/0	2-1/2"	1000
1200-3G	3	3 # 600 KCMIL	-	1 # 3/0	3"	1260
1500-3G	4	3 # 500 KCMIL	-	1 # 2/0	3"	1520
1600-3G	4	3 # 500 KCMIL	-	1 # 4/0	3"	1680
2000-3G	5	3 # 600 KCMIL	-	1 # 250 KCMIL	3"	2100
2500-3G	6	3 # 600 KCMIL	-	1 # 350 KCMIL	3"	2520
3000-3G	8	3 # 600 KCMIL	-	1 # 400 KCMIL	3"	3360
4000-3G	10	3 # 600 KCMIL	-	1 # 500 KCMIL	3"	4200
5000-3G	12	3 # 600 KCMIL	-	1 # 750 KCMIL	4"	5040

NOTE (1): COPPER CONDUCTOR AMPACITY BASED ON 2014 NEC TABLE 310-15(B)(16), 60° C FOR $\leq 100A$ & 75° C FOR $> 100A$

NOTE (2): CONTRACTOR SHALL SUBSTITUTE THE SCHEDULED FEEDER WITH AN ALTERNATE SELECTION OF EQUAL OR GREATER AMPACITY WITH THE PRIOR WRITTEN APPROVAL OF THE ENGINEER.

NOTE (3): COPPER EQUIPMENT GROUND CONDUCTOR SIZED BASED ON 2014 NEC TABLE 250-122

NOTE (4): CONDUIT SIZE BASED ON 2014 NEC TABLE ANNEX C, TABLE C.11-THW/THWN SECTION

NOTE (5): CONDUIT SIZES INDICATED ARE NEC MINIMUM. CONTRACTOR SHALL INCREASE CONDUIT SIZE AS REQUIRED BASED ON ACTUAL INSTALLATION CONDITIONS INCLUDING LENGTH OF CIRCUIT, NUMBER OF OFFSETS AND ELBOWS, AND CABLE PULLING TENSION LIMITATIONS.

CU FEEDER SCHEDULE 4G - THWN-2							
CODE	SETS	PHASE	NEUTRAL	GROUND	CONDUIT	AMPACITY	
20 - 4G	1	3 # 12	1 # 12	1 # 12	1 1/2"	20'	30
30 - 4G	1	3 # 10	1 # 10	1 # 10	2"	34'	30
40 - 4G	1	3 # 8	1 # 8	1 # 10	3/4"	4'	40
50 - 4G	1	3 # 6	1 # 6	1 # 10	1"	5'	55
70 - 4G	1	3 # 4	1 # 4	1 # 8	1-1/4"	7'	70
80 - 4G	1	3 # 3	1 # 3	1 # 8	1-1/4"	8'	85
100 - 4G	1	3 # 1	1 # 1	1 # 8	1-1/2"	11'	110
112- 4G	1	3 # 1	1 # 1	1 # 6	1-1/2"	13'	130
150 - 4G	1	3 # 1/0	1 # 1/0	1 # 6	2"	15'	150
175 - 4G	1	3 # 2/0	1 # 2/0	1 # 6	2"	17'	175
200 - 4G	1	3 # 3/0	1 # 3/0	2 # 6	2"	20'	200
225 - 4G	1	3 # 4/0	1 # 4/0	1 # 4	2-1/2"	23'	230
250 - 4G	1	3 # 250 KCMIL	1 # 250 KCMIL	1 # 4	2-1/2"	255	250
300 - 4G	1	3 # 350 KCMIL	1 # 350 KCMIL	1 # 3	3-1/2"	310	310
350 - 4G	1	3 # 500 KCMIL	1 # 500 KCMIL	3 # 3	3"	380	380
400A - 4G	1	3 # 600 KCMIL	1 # 600 KCMIL	1 # 3	3-1/2"	420	420
400B - 4G	2	3 # 3/0	1 # 3/0	1 # 3	2-1/2"	40'	400
450 - 4G	1	3 # 250 KCMIL	1 # 250 KCMIL	1 # 2	3-1/2"	475	475
500 - 4G	2	3 # 250 KCMIL	1 # 250 KCMIL	1 # 2	3-1/2"	510	510
600 - 4G	2	3 # 350 KCMIL	1 # 350 KCMIL	1 # 1/0	3"	620	620
800 - 4G	2	3 # 600 KCMIL	1 # 600 KCMIL	1 # 1/0	3-1/2"	840	840
900 - 4G	2	3 # 600 KCMIL	1 # 600 KCMIL	1 # 3	3-1/2"	840	840
1000 - 4G	3	3 # 400 KCMIL	1 # 400 KCMIL	1 # 2/0	3"	1000	1000
1200 - 4G	3	3 # 600 KCMIL	1 # 600 KCMIL	1 # 3/0	3-1/2"	1260	1260
1500 - 4G	4	3 # 500 KCMIL	1 # 500 KCMIL	1 # 2/0	3"	1520	1520
1600 - 4G	4	3 # 500 KCMIL	1 # 500 KCMIL	1 # 4/0	3-1/2"	1680	1680
2000 - 4G	5	3 # 600 KCMIL	1 # 600 KCMIL	1 # 250 KCMIL	3-1/2"	2120	2120
2500 - 4G	6	3 # 600 KCMIL	1 # 600 KCMIL	1 # 350 KCMIL	3-1/2"	2520	2520
3000 - 4G	8	3 # 600 KCMIL	1 # 600 KCMIL	1 # 400 KCMIL	3-1/2"	3360	3360
4000 - 4G	10	3 # 600 KCMIL	1 # 600 KCMIL	1 # 500 KCMIL	3-1/2"	4200	4200
5000 - 4G	12	3 # 600 KCMIL	1 # 600 KCMIL	1 # 750 KCMIL	4"	5040	5040

NOTE (1): COPPER CONDUCTOR AMPACITY BASED ON 2014 NEC TABLE 310-15(B)(16); 60°C FOR $\leq 100A$ & 75°C FOR $> 100A$

NOTE (2): CONTRACTOR MUST SUBSTITUTE THE SCHEDULED FEEDER WITH AN ALTERNATE SELECTION OF EQUAL OR GREATER AMPACITY WITH THE PRIOR WRITTEN APPROVAL OF THE ENGINEER

NOTE (3): COPPER EQUIPMENT GROUND CONDUCTOR SIZE BASED ON 2014 NEC TABLE 250.122

NOTE (4): CONDUIT SIZE BASED ON 2014 NEC TABLE ANNEX C, TABLE C.1 THIN-WALL THWN-2 SECTION

NOTE (5): CONDUIT SIZES INDICATED ARE NEC MINIMUM. CONTRACTOR SHALL INCREASE CONDUIT SIZE AS REQUIRED BASED ON ACTUAL INSTALLATION CONDITIONS INCLUDING LENGTH OF CIRCUIT, NUMBER OF OFFSETS AND ELBOWS, AND CABLE PULLING TENSION LIMITATIONS.

Cu Under Ground FEEDER SCHEDULE 3G - THWN-2						
BASED ON EARTH AMBIENT TEMPERATURE OF 20°C (68°F) AND RHO VALUE OF 90						
CODE	SETS	PHASE	NEUTRAL	GROUND	CONDUIT	AMPACITY
1000-3GU	3	3 # 500 KCMIL	-	1 # 2/0	3"	1000
1200-3GU	4	3 # 600 KCMIL	-	1 # 4/0	3"	1200
1600-3GU	6	3 # 500 KCMIL	-	1 # 4/0	3"	1600
2000-3GU	8	3 # 600 KCMIL	-	1 # 250 KCMIL	3-1/2"	2000
2500-3GU	10	3 # 600 KCMIL	-	1 # 350 KCMIL	3-1/2"	2500
3000-3GU	12	3 # 600 KCMIL	-	1 # 400 KCMIL	3-1/2"	3000
4000-3GU	14	3 # 600 KCMIL	-	1 # 500 KCMIL	4"	4000
5000-3GU	16	3 # 600 KCMIL	-	1 # 750 KCMIL	4"	5000

NOTE (1): REFER TO SPECIFICATION SECTION 260500 FOR SOIL THERMAL RESISTIVITY MEASUREMENT REQUIREMENTS.

NOTE (2): CONDUCTOR SIZES AND CONDUIT SIZES ARE MINIMUM SIZES PER NEC. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE AND SHALL SUBMIT THE FOLLOWING A SHOP DRAWINGS FOR ENGINEER REVIEW AND APPROVAL.

- ALL CONDUIT LAYOUTS
- SECTIONS
- SUPPORTING DETAILS
- TO AND FROM ROUTING PLANS
- CIRCUIT DESIGNATION FOR EACH DUCTBANK, IDENTIFIED BY DESIGNATION AS SHOWN ON ONE-LINE DIAGRAMS

- LENGTH OF CONDUIT
- PERCENT (%) LOADING FOR EACH CIRCUIT IN AMPS

NOTE (3): THE CONTRACTOR SHALL UTILIZE THE "E-TAP" OR AMP CALC SOFTWARE AND SUBMIT THERMAL ANALYSIS CALCULATIONS FOR EACH DUCTBANK, VERIFY CONDUIT DUCTBANK BEING INSTALLED, AND SHALL IDENTIFY WHAT CONDUITS ARE SPARES. THIS INFORMATION SHALL BE SUBMITTED IN AN EXCEL TABLE/SPREADSHEET AS WELL AS ALL RELATED DRAWINGS, SECTIONS, AND CALCULATIONS. ALL SUBMITTED DRAWINGS AND CALCULATIONS SHALL BE PREPARED BY AN ELECTRICAL ENGINEER LICENSED IN THE STATE.

NOTE (4): THE CONTRACTOR SHALL, IF NECESSARY, SHALL ADJUST AND UPSIZE ALL REQUIRED CONDUCTORS AND CONDUITS AS REQUIRED TO COMPENSATE FOR THERMAL DERATING BASED ON THERMAL CALCULATION SUBMISSION AT NO EXTRA COST TO THE OWNER.

Cu Under GROUND FEEDER SCHEDULE 4G - THHN-24						
BASED ON EARTH AMBIENT TEMPERATURE OF 20°C (68°F) AND RHO VALUE OF 90						
CODE	SETS	PHASE	NEUTRAL	GROUND	CONDUIT	AMPCACITY
1000-4GU	3	3 # 500 KCMIL	1 # 500 KCMIL	1 # 2/0 "	4"	1000
1200-4GU	4	3 # 600 KCMIL	1 # 600 KCMIL	1 # 4/0 "	4"	1200
1600-4GU	6	3 # 600 KCMIL	1 # 600 KCMIL	1 # 4/0 "	4"	1600
2000-4GU	8	3 # 600 KCMIL	1 # 600 KCMIL	1 # 250 KCMIL	4"	2000
2500-4GU	10	3 # 600 KCMIL	1 # 600 KCMIL	1 # 350 KCMIL	4"	2500
3000-4GU	12	3 # 600 KCMIL	1 # 600 KCMIL	1 # 400 KCMIL	4"	3000
4000-4GU	14	3 # 600 KCMIL	1 # 600 KCMIL	1 # 500 KCMIL	4"	4000
5000-4GU	16	3 # 600 KCMIL	1 # 600 KCMIL	1 # 750 KCMIL	4"	5000
3000-4U	12	3 # 600 KCMIL	1 # 600KCMIL	0	4"	3000

NOTE (1): REFER TO SPECIFICATION SECTION 260550 FOR SOIL THERMAL RESISTIVITY MEASUREMENT REQUIREMENTS.

NOTE (2): CONDUCTOR SIZES AND CONDUIT SIZES ARE MINIMUM SIZE PER NEC. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE AND SHALL SUBMIT THE FOLLOWING A SHOP DRAWINGS FOR ENGINEER REVIEW AND APPROVAL:

- ALL CONDUIT LAYOUTS
- SECTIONS
- SUPPORTING DETAILS
- TO AND FROM ROUTING PLANS
- CIRCUIT DESIGNATION FOR EACH DUCTBANK, IDENTIFIED BY DESIGNATION AS SHOWN ON ONE-LINE DIAGRAMS
 - LENGTH OF CONDUIT
 - PERCENT (%) LOADING FOR EACH CIRCUIT IN AMPS

NOTE (3): THE CONTRACTOR SHALL UTILIZE THE "E-TAP" OR AMP CLIP SOFTWARE AND SUBMIT THERMAL ANALYSIS CALCULATIONS FOR EACH DUCTBANK, VERIFY CONDUIT DUCTBANK BEING INSTALLED, AND SHALL IDENTIFY WHAT CONDUITS ARE SPARES. THIS INFORMATION SHALL BE SUBMITTED IN AN EXCEL TABLE/SPREADSHEET AS WELL AS ALL RELATED DRAWINGS, SECTIONS, AND CALCULATIONS. ALL SUBMITTED DRAWINGS AND CALCULATIONS SHALL BE PREPARED BY AN ELECTRICAL ENGINEER LICENSED IN THE STATE.

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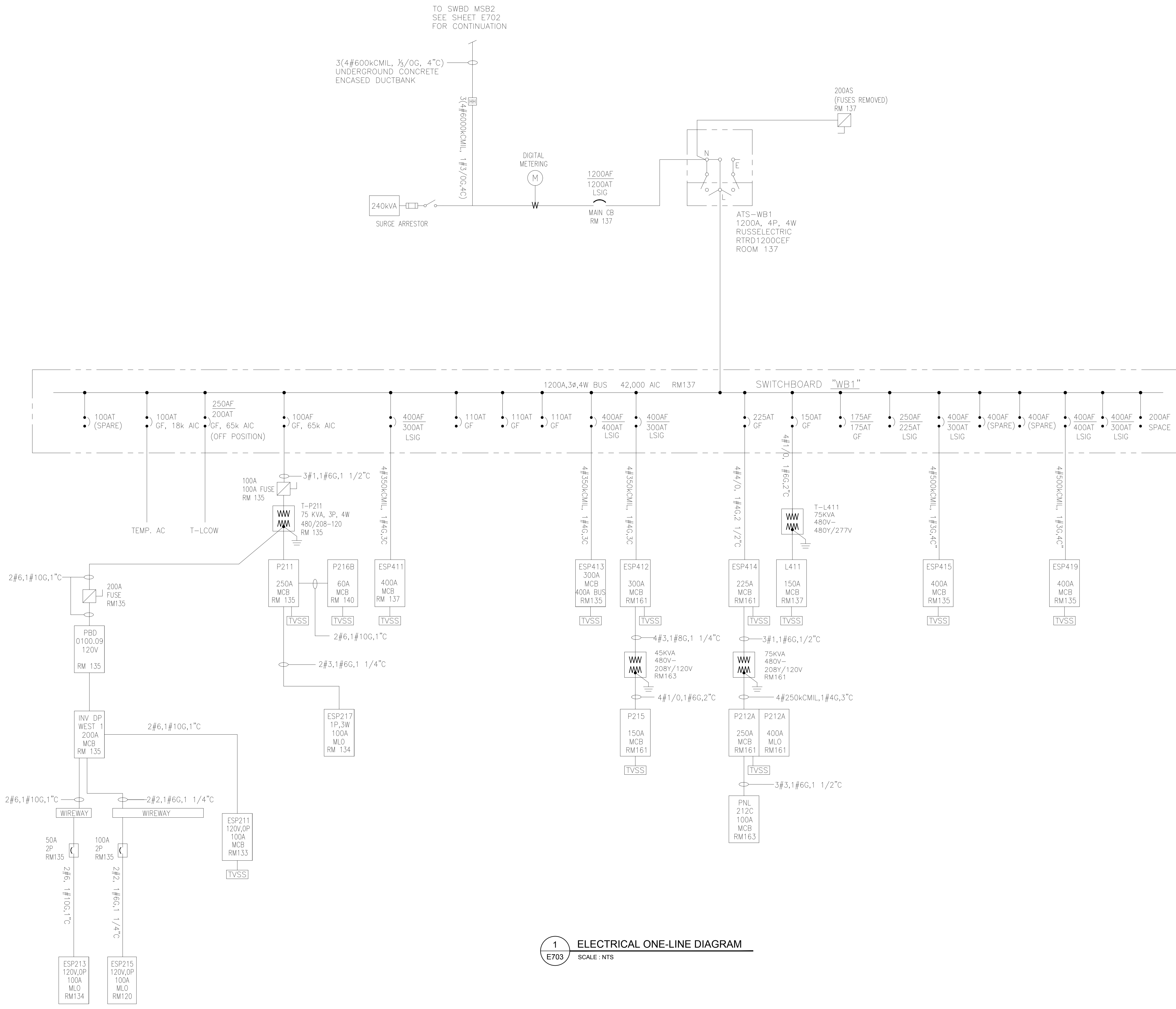
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E703
ELECTRICAL ONE-LINE DIAGRAM
SCALE: NTS

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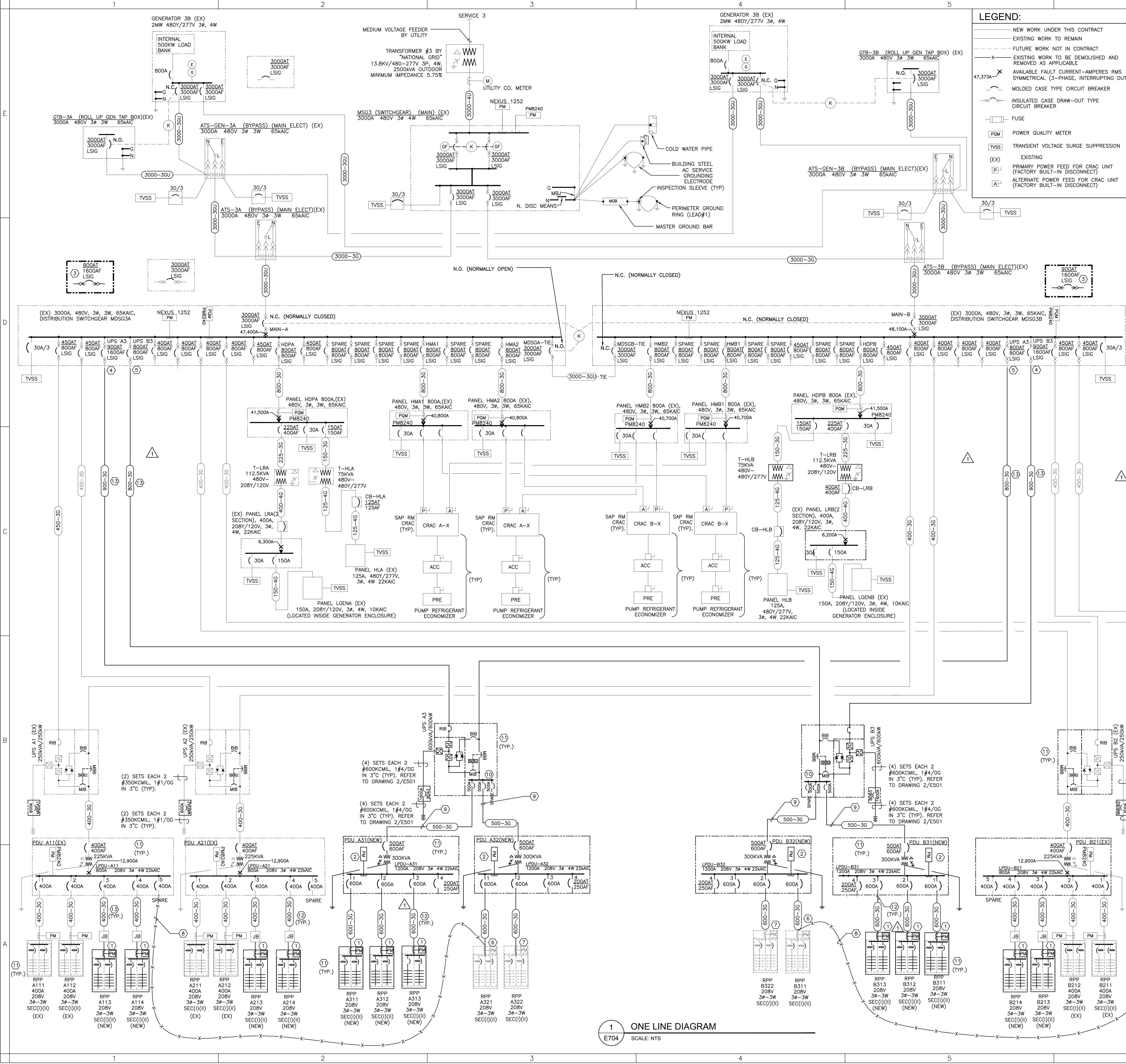
NETWORK COMPLIANCE SUBMITTALS	DATE
ISSUED FOR EOS REVIEW	03.06.2020
ISSUED FOR BIDS AND CONSTRUCTION	03.27.2020
REISSUED FOR CONSTRUCTION	04.16.2020
ISSUED FOR BUILDING PERMIT	05.29.2020

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CAD DWG FILE:	200132400	
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DRAWN BY:	RN	
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SHEET TITLE
ELECTRICAL ONE LINE DIAGRAM

SHEET NUMBER
E703

LAST MODIFIED: 2020-08-20 1:42 PM
EDITED BY: MTC/LC/S
FILE LOCATION: \\2020\201\12140\JZW\Wenborough MAX UPS Cooling 09_CAD\UT Sheets\04_Electrical One Line diagram.dwg



LEGEND:

	NEW WORK UNDER THIS CONTRACT
	EXISTING WORK TO REMAIN
	FUTURE WORK NOT IN CONTRACT
	EXISTING WORK TO BE DEMOLISHED AND REMOVED AS APPLICABLE
	AVAILABLE FAULT CURRENT—AMPERES RMS SYMMETRICAL (3-PHASE, INTERRUPTING DTS)
	MOLDED CASE TYPE CIRCUIT BREAKER
	INSULATED CASE DRAW-OUT TYPE CIRCUIT BREAKER
	FUSE
	POWER QUALITY METER
	TRANSIENT VOLTAGE SURGE SUPPRESSION
	EXISTING
	PRIMARY POWER FEED FOR CRAC UNIT (FACTORY BUILT-IN DISCONNECT)
	ALTERNATE POWER FEED FOR CRAC UNIT (FACTORY BUILT-IN DISCONNECT)

GENERAL NOTES:

- REFER TO DRAWING E800 FOR GROUNDING DETAILS AND E801 FOR GROUNDING AND BONDING DETAILS.
- REFER TO DRAWING E700 FOR FEEDER SCHEDULE.
- REFER TO DRAWING 4/E503 FOR TRANSFORMER GROUNDING DETAILS.
- REFER TO SHEET E001 FOR UNDERGROUND FEEDER REQUIREMENTS.
- REFER TO PANELBOARD SCHEDULES FOR MORE INFORMATION AND BRANCH CIRCUITING.
- ALL BREAKER 100AMP AND ABOVE SHALL BE 100% RATED.
- ALL NEW CIRCUIT BREAKERS IN ALL DISTRIBUTION BOARDS AND PANELBOARDS SHALL HAVE "AIC" RATINGS AS INDICATED ON DRAWINGS.
- ALL NEW EQUIPMENT SHALL BE LISTED AND LABELED BY UL AND SHALL BE INSTALLED PER LISTING OR LABELING.
- ALL TERMINATIONS SHALL BE TORQUE TO MANUFACTURER'S SPECIFICATION. SUBMIT TORQUE LOGS TO ENGINEER AND OWNER AFTER COMPLETION OF PROJECT.
- ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NEW FEEDERS AS SHOWN ON ONE DRAWINGS WITH NO SPLICES.

KEY NOTES:

KEY NOTES:

TREND POINT METER TO BE INTEGRAL TO RPP ENCLOSURE. REFER TO SPEC SECTION 262610, PROVIDE SEPARATE 120VAC PROTECTED POWER SOURCE FOR METER POWER. PROVIDE CAT 6 AND INTERCONNECT WITH VZW END NETWORK OBTAIN IP ADDRESS FROM VZW AND LABEL AT METER FACE.

TREND POINT METER (ENKAPIS X-WZW-MSCUDU) TO BE INTEGRAL TO PDU ENCLOSURE. REFER TO SPEC 262600. PROVIDE PROTECTED POWER SOURCE FOR METER POWER. PROVIDE CAT 6 AND INTERCONNECT WITH VZW END NETWORK OBTAIN IP ADDRESS FROM VZW AND LABEL AT METER FACE.

CONTRACTOR SHALL PROVIDE SURE BREAKER SHIP LOOSE AND SAILOR MANUFACTURER, TYPE AND AMPCITY OF NEW UPS INPUT BREAKER.

CHANGE EXISTING TRIP UNIT FROM 1600AMP TO 900A. COORDINATE WITH SWITCHGEAR MANUFACTURER FOR REQUIREMENTS.

USE EXISTING 800AMP SURE BREAKER.

EXISTING RPP WITH TEMPORARY FEEDER INSTALLED IN PREVIOUS PHASE. DISCONNECT AND REMOVED EXISTING FEEDER AND RECONNECT TO NEW FEEDER AS SHOWN.

EXISTING RPP INSTALLED IN PREVIOUS PHASE WITH NO FEEDER. PROVIDE NEW FEEDER AND CONNECT THE RPP.

EXISTING TEMPORARY FEEDER TO BE DISCONNECTED AND REMOVED.

SUPPLY AND INSTALLED 2 SETS 3#350CMIL, 1#1 USING EXISTING 4" UNDERGROUND CONDUIT.

CONTRACTOR SHALL COORDINATE WITH UPS / SIDEARM VENDOR AND SHALL PROVIDE AND INSTALL REQUIRED INTERCONNECTION FEEDERS, LUGS, NIPPLES, AND RACEWAY BETWEEN SIDEARM AND UPS.

PROVIDE EXISTING AND NEW EACH UPS, PDU, AND RPP SHALL BE TAGGED WITH VINYL LETTERING AT LEAST 6" TALL WITH THE EQUIPMENTS ID(EG. RPP 8111) VINYL LETTERING SHALL BE RED IN COLOR WHILE "1B" TAGS SHALL BE BLUE. LETTERING SHALL BE 1/2" OR SIMILAR.

REFER TO DRAWING E301 FOR RPP CONDUIT INFORMATION NEW OR USING EXISTING. ALL NEW CONDUIT WILL BE RUN UNDER RAISED FLOOR USING EMT CONDUIT.

NEW OVERHEAD EXPOSED CONDUIT AND CONDUCTORS.

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